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THE ILLUSTRATED JOURNAL OF AGRICULTURE

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

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No. 5.

How to improve the state of agriculture in the Province. (1)

I have thus shown, and I say it without fear of contradiction, that what is wanted here, if we are serious if our endeavours to promote the improvement of agriculture, is a "Superintendent"; a man thoroughly up to the duties of his office, one who is endowed both with the authority and with the qualities necessary for the fit discharge of his functions, and not subjected, as regards his place, to be deprived of it by any of the capricious changes so common in the world of politics.

It should, moreover, be the business of the superintendent to afford effectual guidance to the societies of agriculture, to the provincial exhibitions, to the agricultural schools &c., that the government grant may be properly expended, and may bear the fruits that we have a right to expect from its distribution. A select council should be added, as his advisers, chosen, as much as possible from the residents of the senatorial electoral division of the province; a body of men they should be, devoted to the progress of agriculture, in their separate localities first, and then in the entire province.

A system of practical instruction suited to the comprehension of even the humblest *habitant*, and sown broadcast over the whole country, closes the list of the things that seem to me necessary to perfect our official organisation in this most important matter.

It is no new idea, this of appointing a superintendent of agriculture. It has, for more than 30 years, been the favourite notion of those whose opinions on the subject are best worth listening to. An analogous principle was entertained by the Legislature of United Canada, and, afterwards, by our own province, as regards the Department of education. After Confederation, an endeavour was made to confide this office to a Minister of the Crown; but experience soon taught us that, for this post, it was necessary to appoint an experienced head, one altogether untrammelled by political ties, entrusted, only, with the duties of this single function, and irremovable on any change of Ministry. If the Legislature felt, then, the propriety of thus acting as regarded education; why should it not do the same, now, as regards agriculture.

Is agriculture, by which alone bread is afforded to the people, of less importance than public instruction? Has the exodus to the United States been arrested, nay, has it even been diminished, by educational advantages? No; half a million of our friends have left us, in spite of all the efforts we have made to retain them, and, should the neighbouring people ever again renew their once prosperous industries, public instruction will never prevent Canadians from crossing the border which lies between them and a land where gain is more easily acquired than in their own country.

(1) Third part of Ed. A. Bernard's prize essay on *Agriculture*, translated from the French by A. R. Jenner Fust.

The only barrier we can oppose to this emigration, and thus retain our brethren in the bosom of their mother land, is the colonisation of our waste lands and the restoration of the prosperity of our agriculture. Nothing but practical, impressive (*frappant*) instruction in the elements of good cultivation can be taken as the first step in the re-establishment of our agriculture; it has slept so long that, on its awakening from its drowsy slumbers, we must begin at the very beginning. And it is not to the children alone that this teaching must be given, but first and above all, to the farmers themselves, and, if possible, in every parish. *The State, too, must give more of its attention to the agricultural interest of the nation.*

Thus, agriculture, to sum up its wants, requires a skilful supervision; a good system of teaching the elements of the science must be spread abroad over the province, and, to succeed in making this teaching effective, we must have a superintendent qualified to fulfil the arduous task imposed upon him, endowed with full authority, and furnished with wise counsellors and able assistants to aid him in his labours.

The presidents of each senatorial division should have the choice of the members of the Council of Agriculture in their own proper district. It should not be entrusted to the government. A better representation in the Council would thus be obtained, as each member would be on the very best terms with the societies of his division, and those members of the present Council who are the most distinguished for their devotion to the cause of agriculture would not fail to be chosen to serve on the new body.

The opinion of the Committee of enquiry on the subject of the appointment of a superintendent of agriculture, given so long ago as 1850, cannot be wanting in interest at the present time; it is as follows:

"Your committee believes that the nomination of two superintendents of agriculture, one for the districts of Montreal, St. Francis, and Ottawa, and the other for Quebec, Gaspé, and Kamouraska, is indispensably necessary. He would attend to the administration of the whole system, and, with the Professors, would constitute the board of instruction: an annual visit to each of the districts under his control would form part of his duties, in addition to the publication of a yearly report setting forth the style of cultivation therein pursued, and its usual success or failure, together with any suggestions that enquiry and observation have created.

The late Major Campbell, of St. Hilaire, president of the Chamber of Agriculture of Lower Canada, thus expressed himself at this time;

"If a grand scheme for the improvement of farming is seriously contemplated, my own idea is that some one man should be selected as chief, whose whole time and attention would be devoted to the subject. He may be called Commissioner, or Superintendent of agriculture, and he, with the Mayors of the different counties, and the Presidents of the agricultural societies, should be the officers in charge of the

model-farms of which I have spoken. The experimental farm should be under his care, and it should be part his duty to see that all experiments tried on the model-farms should be carefully conducted, and a regular register of their results kept. I need hardly add that the success of this project depends, entirely, on the choice of the person entrusted with these important duties."

It seems to me that a single superintendent for the province would be sufficient, but he should have, in addition to the council of agriculture, active and experienced assistants, each charged, under his direction, with the duty of visiting and inspecting a certain district of the country. These assistants, as soon as they are qualified by experience, would direct and watch over the societies; they would visit the parishes of their respective divisions, they would report as to the wants of agriculture, and would deliver, on the spot, to the farmers of the neighbourhood, familiar lectures containing counsels for their future guidance.

It has been, I think, sufficiently proved that the good administration of our agricultural affairs demands imperiously the appointment of a superintendent of agriculture. We must now enquire what direction he ought to give to the societies, that the public may derive from them that benefit which they have a right to expect.

It is admitted that, although up to this time, most of the agricultural societies have restricted their operations within a very narrow circle, still, that they ought to extend their advantages, as equally as possible, to all the parishes in the country. The means to be employed to effect this are, to offer prizes in each parish for the most useful improvements, and the same for the counties, that the best farmers of each parish may be incited to show themselves the best farmers in their own county. The parish prizes which will do the most good are those offered for the best cultivated farm as a whole. All parts of the cultivated land on each farm should be included in the competition for these prizes; it will show, in reality, who are the best cultivators, and, if the decision is carefully considered, if the judges, in giving their judgement, show by means of marks for each division of the land, the comparative state of advancement at which each farmer has arrived, they will give the best possible lessons on agriculture, since their decision will point out that which is perfect, and how much remains to raise the rest to an equal condition.

Marvellous effects have followed the introduction of this system wherever it has been tried. Cultivators in several parishes, in several counties, have begun their preparations two years before the date of the competition, by improving the whole system of their procedure, and by, as much as possible, curing all the defects of their cultivation. Only good judges are wanting to make these contests exceedingly popular. Our best farmers, as every one knows, are not devoid of pride, and, in every parish, there are at least fifteen or twenty who would be very loath to admit their inferiority to their fellows. Let only a competition be opened in any parish and there will be no want of competitors, many of whom will make arduous efforts to merit and win the prizes, so that, if the umpires do their duty, the winner of the first prize will exhibit to his neighbours a truly *model-farm*, the more useful as a model, in proportion as the judges have pointed out how much remains to be done, before it can be said to have arrived at perfection.

By following out the same system of marks, the judges will easily decide who are the best farmers in each county. Thus, the best farm, in each parish, the best farm in each county, will be patent to the view of all. Talk about *model-farms*, indeed! We want *model-farms* in each county. That is what all sensible men have been asking for during the last fifty years. There can be no means pointed out for the esta-

blishment of genuine *model-farms*, except at a great expense to the country, poor enough, and indebted enough already, so likely to be successful, as the encouragement, by means of the prizes we have spoken of, in each of the parishes and counties of our land, of a sound and honest competition.

But, if this system is to be successful, enlightened and unbiassed judges must be chosen, independent enough to point out the defects of even those farms to which they have given the prizes. They ought to show why certain marks have been assigned to certain bits of cultivation in preference to others. They should, also, give in a carefully revised report of their work, that every farmer may become acquainted with the reasons which have influenced their decisions. If they could manage to read aloud in public, and comment upon their judgment, in each parish of the county, it would be giving one of the best practical lessons in farming, and, one that the farmers themselves would not be slow to appreciate.

To lay down a scale of marks for the guidance of the judges is simple enough. The number of marks, more or less, for each division of the agricultural improvements, would make the farmers understand what are their own points of excellence, wherein their competitors excel them, and what are the particulars of their system which must be corrected before they arrive at perfection.

The Superintendent should have the power of granting certificates, and medals of different value, according to the degree of merit at which each competitor has arrived. An emulation of the most useful kind cannot fail to arise among our agricultural population, if it be once kindled by such devices as these.

I have laid great stress on the prizes for the best cultivated farms, because they seem to me of the greatest importance; but it will be easy to encourage, with such an organization, all the improvements in farming which may be thought necessary, especially the most simple and the most pressing. Neither will this plan put a stop to the provincial and county exhibitions. Still, I think they might well be held less frequently, since they do not pay their expenses, and thus a considerable part of the government grant might be appropriated to the prizes for the best cultivated farms, ploughing matches, etc, in every parish, in every county, and even in every district. For, it must be admitted, these competitions will cause greater improvements to take place in agriculture, than can be expected from the very best managed exhibitions.

As to the best cultivated farm competitions, it will always be difficult to find a judge thoroughly competent to discharge the duties of his function, and who will himself take the trouble to visit each of the parishes of his county. Formerly three judges were necessary; this would only add to the expense, and run the risk of having two incompetent men to one competent. In my opinion, one judge is enough, particularly if a right of appeal, in cases of disputed decisions, should lie to the superintendent. He should carefully watch the labours of the umpires, since the success of this plan will depend, entirely and emphatically, on the greater or less intelligence and activity which they display in the discharge of their duties. By granting this right of appeal, the competitors will be better satisfied, and the judges will be induced to do their best to deserve the approbation of their chief.

But, however perfect may be the guidance given to the agricultural societies and exhibitions, both provincial and local, it is certain that our system will be incomplete if it do not embrace a thoroughly planned curriculum of agricultural instruction.

As far as I can see, this teaching should include first, the publication of a short elementary treatise, thoughtful, but essentially practical, secondly, the publication of a good journal of agriculture, with illustrations, thirdly, instruction in the

elements of agriculture in all schools, &c., aided by government, fourthly, the development of our special schools of agriculture, to each of which should be annexed a farm to be carried on as a really model-farm, and the net profit, or loss, of which should be published in detail every year; fifthly, an annual visit should be paid, by the superintendent himself, if possible, if not, by some one delegated by him, to each of the parishes of the county, and to all the societies and schools specially devoted to agriculture, that the most perfect watchfulness, and closest attention may be exercised over them all.

It is by means of this thorough system of inspection that direction, encouragement, and instruction, will be made easy to give: and blame too, if blame should be considered necessary.

Short works, written in a clear and precise manner, should be published, and distributed almost gratuitously. They should contain simple, but positive lessons on the way to farm with profit, couched in language easily "understood of the people." In these, every sensible farmer should find instructions to guide him surely in any improvements he may propose to make. Their limits need not exceed a hundred pages, and their circulation should be encouraged as much as possible.

And so with the *Journal of Agriculture*, by means of which the superintendent will be placed in direct communication with every one of the members of the agricultural societies. These should all receive the *Journal* as a prize, so to speak, from government, and thus, with the advantages to be derived from our proposed agricultural organisation, it may be hoped that, before long, every farmer, even the least intelligent, will become a member of his county society. The *Journal* will then be read, or, at least, received by all. Its task will be to develop the different subjects glanced at in the elementary treatise, and to give clear and definite answers to the questions asked by its readers, or farming, horticulture, arboriculture, entomology, and veterinary science. It is unnecessary to add that the superintendent should have the entire control of the *Journal*.

The superintendent, or his delegates, should visit yearly each of the agricultural societies, should examine the books and accounts, which ought to be compared with the annual reports, and familiar conversation should be held with the officers and directors. The greatest good will accrue to each individual parish from these conversations—far more than from official correspondence, which will generally be a mere sham, and a mockery. At these visits to the capital of each county, the superintendent will find no difficulty in observing, in each parish of the county, the different improvements that require their execution most rapidly, and the difficulties which remain to be overcome. He will meet the best farmers and give them lectures on agricultural subjects, which, if they are made as practical as they ought to be, will be productive of immense good to them. The *Journal*, too, will not fail to reap great benefit from these visits—they will add largely to its choice of subjects—and, truth to tell, these lectures, given to the farmers themselves, seem to me the complement of every useful organisation for the improvement of agriculture.

I shall not expatiate on the advantage of elementary teaching on agriculture in all the schools; that question is settled. The Honorable J. Ouimet, minister of education, has already received the support of the public in his persevering efforts in favour of this form of instruction in the public schools of the Province. Let us hope that agricultural teaching will soon become the rule in our primary schools, and that the colleges, commercial as well as classical, and all the convents in the country, will follow in the same steps. It is useful, it is even necessary, that the whole of our youth who

are at school should learn, at least, the elements of that art which furnishes the means of life to all, which promises to every family engaged in it the safest and most peaceful future, and which furnishes, for the entire nation, the only solid base of general prosperity. And, in the consideration of agricultural instruction in our convents, it must not be forgotten that the spread of education, in our province especially, is the work of the women. It is then to the future mothers of our race that the real meaning of the art of agriculture should be taught, what it should be, and what the Creator intended it to be, namely, the foundation of our social system. This is the more necessary, since a strange dislike to become the wives of farmers appears to reign among our country girls who have been educated in convents, a large proportion of them preferring to espouse artisans and even labourers, to marrying farmers. It will suffice to teach them the principles of horticulture, and the management of the dairy, of the poultry-yard, of the orchard, and of the bee-hives. Horticulture being the perfection of cultivation, a knowledge of it would embrace a more perfect comprehension of the groundwork of agriculture, and the other things follow as of course; for, wherever there is a garden, there may be a poultry-yard, an orchard, and a few hives of bees—they will be found useful everywhere; and a moderate practical acquaintance with these things, joined to intelligence and good will, must, in the wives and daughters of our agriculturists, tend to the general good, and the fructifying development of our cultivation.

Many useful endeavours, not without success, have been made, by the rural clergy in France, to afford to their female parishioners these advantages, and special establishments have been founded for the express purpose of educating women in the proper duties of farmers' wives. At their house at Beauvais, among others, the "Christian Brothers" have provided for the practical and scientific instruction of young men in the art of agriculture, and this school, which is said to be self-supporting, is acknowledged by all to be one of the best in Europe. Let us hope that, before long, we may see similar good works arise throughout our own country.

After fifteen years spent in groping in the dark, and in a constant struggle for mere existence, it may be said of our agricultural schools that they have begun, at last, to do real and good work. Still, in spite of great advantages offered, there are far fewer pupils than there ought to be. The young men, seeing that their presence is necessary to the very life of the college, are hard to please, and will not do what is required of them. In fact, if they did not receive free board, there is no doubt these establishments would be empty. A sad thing, indeed, but it only proves more clearly that it is the duty of Government to endeavour to create a real love for agriculture, and to make its elementary teaching popular, that a taste for the higher instruction in this art may be engendered in the pupils: their numbers will then increase and we shall have made at least one grand stride in the advancement of our object.

That agricultural education should be made general is, I am convinced, the one thing necessary for the improvement of our farming. It will be useless to work until we have made this instruction loved and sought after; and, until then, all the grants imaginable will be only so much pure waste; we must start from this point, and the keystone of the whole structure which I have been raising is the appointment of a superintendent.

How important, then, is the task undertaken by Mr. Ouimet, and how earnestly should we back him in his endeavours to effect the reforms he has inaugurated. One means of popularising the teaching of agriculture occurs to me here: the distribution of the best and most authoritative works on farming, as prizes, in our schools, colleges and

convents. Again, rewards should be distributed, both in honours and in money, to all those teachers who give the best instruction in our subject, and whose pupils pass the most successful examination; always distinguishing those teachers, men and women, who have cultivated with the most profit a garden, with its usual accompaniment of bees, vegetables, and fruit of all kinds; thus showing that they have a practical, as well as a theoretical acquaintance with their subject.

I shall perhaps be told, that the very foundation of my whole system is rotten. In fact, in reading the different reports of the commissioner of agriculture, I have seen, with astonishment, the declaration of a functionary (M. Georges Leclerc, secretary to the Council of agriculture) on whom, more than on any one, the whole working of our agricultural system, for the last twenty years, depended, that the old Board of agriculture, and the present Council of agriculture, have never been able to find a fit editor for a journal of agriculture, and, that no such man exists in the country! How then can we hope to find a superintendent of agriculture and competent aides? I reply that if any one, fair and just, will look around him, with his eyes open, he will see plenty of fit persons—are there not men in abundance like Le Sage, Joly, Tassé, Casavant, Browning, Schmouth, Marsan, Landry, Benoit, Blackwood, Pilote, Beaubien, Ross, Gaudet, De-Blois? And how many others are there, less prominent perhaps in position, but who only await the signal to offer to the public those services for which their fitness eminently qualifies them.

The merit even of novelty is not due to many of the things which I have suggested. They may be found, often fully developed, in several of the public documents, more particularly in the report of M. Taché, deputy-minister of agriculture, at Ottawa. My frequent quotations from this work may serve, perhaps, to bring it back to the recollection of the public who seem to have forgotten its existence.

It is then with confidence that I submit my work to those enlightened men to whom the happy idea occurred that a competition should be opened, by the *Institut Canadien de Québec*, for the purpose of studying one of the most important and pressing questions of the day.

In bringing my labours to a close, I would recall to my countrymen those words so full of wisdom addressed by Fénelon to the statesmen of France. Appropriate to us they are—may they be as useful to us as they are appropriate: “The power and welfare of a state do not consist in a multitude of half-cultivated provinces, but in extracting from the ground which we possess all that is necessary for the support and well being of a numerous people.” In truth, in our vast, and eminently agricultural country, we can no longer feed our own population, our production falls far short of it! Another French bishop, M. Dupanloup, expressed himself as follows: “Let it be thoroughly understood that there is no one, man or woman, however illustrious by birth, by deeds, or by services, who should fear to debase himself by following a career so noble, so useful, as that of agriculture; and, I will add, of a social importance so vast, regard being had to its influence in morals and manners, no less than to its influence on the national wealth.”

Until the educated classes throw aside their false pride, and devote themselves to the study and practice of an intelligent agriculture, it is vain to hope for any amendment in the present ruinous state of our country affairs. Can we hope that an example will be set by them without a complete change taking place in the customs and manners of our society? I say it with bitterness and profound discouragement: I shall never see this change.

Many a time does the question occur to me; will the times, so blessed to our country, ever return, when our

ancestors, rich or poor, passing their life, in our smiling and, then, fertile farms, were, by the confession even of their enemies, a nation of noblemen? Those times when the whole Canadian aristocracy took delight in passing the entire year in the country; occupied in the cultivation of their farms; when mothers and daughters carded, span, weaved, full of joy and pleasure, clothes, linen and carpets; piqued themselves on making with their own hands all things necessary for their families, and provided them so bountifully, that there was enough to spare for the poor? Ah! I fear those happy days will never return.

As for me, bending as I have bent, under the rude and wearying labour of the fields, I have grown gray, not without happiness though, in the service of agriculture. It is nearly thirty years ago that, more sanguine and ardent than now, I rejoiced with all my heart when I read, for the first time, the report of the enquiry into the state of agriculture so often quoted here. I flattered myself with the hope that such wise counsels would soon bear fruit. Alas! since those days many of the well wishers to their country who took part in the enquiry are gone; their hopes of a better and more prosperous future, induced by a better organisation and a wiser guidance, have perished with them. Of those who remain, many have probably lost for many a day all expectation of seeing with their eyes those improvements they did their best to bring about.

My own age is too far advanced for me to hope to see established an organisation framed purely with a view to the benefit of agriculture, and utterly free from political favouritism. Too few are the men in our country, and especially political men, who busy themselves with this question.

Nevertheless, I thoroughly believe in the truth of the motto prefixed to this work—a motto which has been my guide all my life—“He who makes two blades of grass grow, instead of one, is, without doubt, his country's benefactor.” These words struck me while still a youth, and I can, now, safely apply them to myself, as I have indisputably made *three* blades grow over the whole of my farm, where, formerly only one was produced; and, if I, why cannot the majority of my countrymen do the same?

And, if this essay should succeed in opening the eyes of some few among the educated young men before whom the vista of a prosperous future lies open; if I should succeed in convincing them how much happiness, even here below, is enjoyed by the cultivator who loves and serves his God; if I could influence some good patriots, but, above all, some statesman of the future, to embrace the useful, the noble career of the agriculturist, I should have the consolation in my last hours of reflecting that I had not lived utterly in vain.

FALL WHEAT SOWING.

There is no reason why wheat sown in the Autumn should not succeed in this Province. The greatest care must, of course, be taken to select the situation of the ground. We need hardly say that it should be dry; not on a side hill; not in a place where the snow is likely to be driven off by the wind, nor where it lies too late, from shade or other causes, in the spring. The previous crop should be taken into consideration: wheat after another grain crop is not good farming.

The preparation for the crop is simple enough. Let us suppose an acre of early potatoes removed from the ground. The land should be pretty clean, if the horse-hoe has been employed as it ought to be up to the last possible moment when the haulm is nearly ready to shake hands across the rows. The *grubber* passed across the drills will level them and the seed—6 pecks to the acre—may be sown broadcast

and ploughed in with a furrow of 3½ inches deep by 9 inches wide. No harrowing afterwards, if you please, as the rougher the land lies all the winter the better. The crests of the furrows will protect the young plant from the cutting blasts

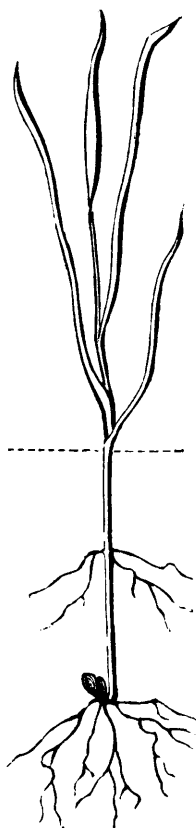


FIG. 1.

which might lay the roots bare. Now what is the rationale of this? Wheat, like barley and oats, has two sets of roots, one set springing from the seed, the other from the stem about an inch below the surface. At whatever depth the seed may be deposited, it stands to reason that, as the depth of the coronal, or uppermost roots is constant—one inch from the surface or seed—if the seed is only one inch deep, the coronal and germinal roots will be so close to each other as to have no separate influence; but, at three or four inches deep, they will stand well apart, and the coronal roots will be able to exert their intended office of acting as *guy-ropes*, or *stays*, and the plant will be less likely to be drawn out of the ground by the alternate frost and thaws of early spring.

It is, in every case, from these coronal roots that the *tillering* takes place.—(See fig. 1).

Now, when the seed is deposited at random near the top—see fig. 2—the pipe of connection between the two sets of roots is very short, the plants reaps no benefit from its double provision, and, it must be plain to the most careless observer, runs a great risk of being left bare of earth, when after the alternate expansion and contraction caused by frost and thaw, the rough gusts of wind pass over it in March and April.

This plan of ploughing in wheat is very much to be preferred to drilling it with the machine, unless horse hoeing is intended, because, in the first place, the ground need not be made so fine—the drill will not keep its depth unless the land is almost in a state of meal—and wheat we know requires a firm texture of soil. Again, the crests of the furrows, if the land is laid up as it should be at an angle of 45°, will certainly prove a great defence to the young plant in autumn, and, in spring, will moulder down and earth up the roots.

When the winter is passed and the land is dry, a pair of light harrows should be passed across the rows; do not fear pulling up the plants—there is no danger—the heavy roller now follows and completes the job. Immediately after this the tillering begins and will astonish most people if they have never seen wheat cultivated after this fashion.

In this Province the wheat should be in the ground by the 15th September: if the grain is buried even four inches deep it will be up in from eight to ten days—no good arises, but rather the contrary, from too rank a growth in autumn.

Experiment tried at Compton 1871, October 9th; sowed broadcast 2 bushels of wheat on an acre of land—previous crop, *spring wheat*—manure 2 cwt. *phosphate* (no such thing,

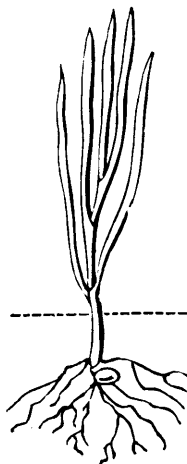


FIG. 2.

but it was sold for superphosphate) situation, side hill, lower part, so that, when the wheat plot was bare of snow, the upper part discharged its thaw-water across the wheat, and created, by its wash, beautiful little banks of sand containing all the richest parts of the soil, at the bottom of the hill. Crop, reaped August 10th 1872—three bushels of wheat, and about four large cart-loads of weeds. The experimenter wisely came to the conclusion that “Fall wheat wont do in this Province!” The only germs that stood were, of course, those that were, by accident, deeply buried.

The hardships wheat will endure are incredible! The following is the system pursued in the Eastern counties of England on both light gravel, and heavy clay. The writer practiced it for twelve years in Kent and Essex, and always found it answer.

Wheat—5 pecks to 6 pecks per acre—drilled 3 inches deep in October and November, on clover ley well harrowed before sowing, so that one stroke, or tine, covered it afterwards. Land lay rough all the winter. Spring cultivation began by harrowing across the rows (8 inches apart) then the horse-hoe, with stercerage, *fitting the drill* followed, going over, with one horse, a boy to lead, and a man to steer, about eight acres a day. The heavy smooth-roller came next—weight about 4000 lbs.—drawn by four horses, and Croskill’s *clod crusher*, which leaves the land nice and rough so that the rain does not form a crust, finished the work. After all this tormenting the crops used to average forty bushels per acre, and, in 1853 the writer’s wheat was adjudged to be the finest 83 acres in the county.

The horse-hoe must be of the same width as the drill or the former will not work. We should like to see it in use here—Smith’s, of Kettering, Northampton, only costs £6,10 and does its work to perfection. Of course, Garrett’s, of Saxmundham, is the best, but it is too complicated for Quebec.

A. R. JENNER FUST.

ON BREEDING.

The problems connected with this subject are numerous and intricate. For example—why is the produce of a Dorking cock and a Cochin hen, quite different to the produce of a Cochin cock and a Dorking hen? It is so, and remark, that the difference, though more or less various in quantity, is constant in quality.

Why, again, in the mule, is the produce of the male horse and the she ass utterly distinct from that of the stallion donkey and the mare? So different, indeed, is one from the other, that there is a distinctive name for it in England, viz. the “Hinky,” the mule being, almost invariably, the offspring of the male ass and the mare; the “Hinky” being very seldom bred.

Once more; there is the well authenticated account of the thoroughbred bay mare. This animal whose pedigree did not contain one ancestor whose colour was in the least degree mixed with white—gray thorough-breds being extremely rare, so rare that, during a pretty long experience on the turf, the writer only remembers three or four—was, accidentally, served by a gray cart horse, to the intense disgust of her owner. The foal was bay; but seven succeeding foals, all got by bay, or brown, racing stallions, had, every one of them, more or less, stains of white in their coats!

As to the original whence our domesticated animals spring, there can be little doubt that, as in the case of wheat, and other cereal grasses, they have been fostered and cultivated by the hand of man, until the rough progenitors of our modern Devons, Kyloes and Herefords, have, in the persons of their descendants, become the smooth, finished pictures we now see at our exhibitions,

These are *races* as distinguished from the *breeds*: we may talk of the Devons as a race, but the term cannot, with propriety, be applied to the Shorthorns; it requires only a glance at a herd of the former to see that, from their colour and general conformation, they have never been mixed with other stocks, whereas, the latter bear evident marks of having been, so to speak, created by the wit of man out of an amalgamation of selected specimens of various kinds, until a type, previously fixed upon by each separate improver, has become fixed and determined.

I need hardly say, that the first person who formed the idea of originating a *breed* of domesticated animals which should be superior to the native *races*, the *aborigines*, was Robert Bakewell, of Dishley. He began with the sheep; which, rough and ragged, small and ill-shaped, as was the stock then bred from, he succeeded, by patient selection and considerate matching of parents, in improving into the "New Leicester." The horned cattle of his neighbourhood, for he wisely chose the animals nearest to his hand, next felt the magic touch of his genius, and became the modern "Longhorns," still highly esteemed in the pastures about Leicester and Rugby; prizes being still given by the Royal Agricultural Society for the best specimens of the breed.

Stirred up, we may well suppose, by the fame of Bakewell, the brothers Colling next appear on the scene. They, fortunately for us as for themselves, had better and more abundant material to work upon than had their predecessor. Contemporary with the Collings, but working quite independently of them, came Thomas Booth, of Warlaby. Somewhere about 1790 this gentleman having observed that the valley of the Tees was depastured by a fine, roomy stock of cattle, conceived the idea of improving them. The defects which he aimed at suppressing were an undue prominence of hip and shoulder point, a general "soda water bottle" appearance, too much *daylight* under the belly, and a want of uniformity in laying on flesh evenly and firmly all over the frame. Selecting a few cows from the herd of a tenant of Lord Harewood named Broader, of Fairholme, and coupling them with moderate sized bulls, Mr. Booth succeeded in laying the foundation of his son's still celebrated herd, many of the most illustrious families of modern Shorthorns owning their descent from the Fairholme purchases. In pursuance of his plan of moderating the general looseness of build, then one of the most observable defects in these Teeswater cattle, the founder of the Warlaby herd was greatly aided by bulls hired from the brothers Colling; amongst others to *Hubback*, *Albion*, and *Twin Brother to Ben*. We shall see, presently, how these animals were bred, and what was the effect of their peculiar line of blood.

The principle upon which all these earlier breeders went was the well known one, that "like produces like"; an un-failing principle, truly, but one which admits of a far more general application than is generally allowed, and should be regarded not only in the coupling of the sexes for the propagation of the inferior animals, but also in the continuation of the human species. If more attention were paid to this rule by our heads of families we should not have so many idiots and consumptives among us. Nature always avenges an infraction of her laws.

But, while it is perfectly true that "like produces like," there is another rule that steps in to teach us caution; and that is the tendency of all animals to "throw back" to some remote ancestor, whose probably forgotten points suddenly make their appearance in one of his descendants. This is called "Atavism," and is frequently observed by the breeders of white pigeons, who, in spite of all their pains to keep their birds pure in colour, find constantly, to their trouble, that

black feathers will show themselves in the youngones. (1)

Here then we find the rule established; that it is not sufficient that the immediate parents be of fine shape, good colour, and robust constitution, but they must be descended from families, who, for generations, have boasted of these desirable qualities, if we are to hope for an offspring that shall not disappoint our expectations. This point we shall have occasion again to touch upon when we come to speak of in-and-in breeding.

The form aimed at by all breeders is the solid figure known to mathematicians as the parallelopipedon. A carpenter's pencil will give a good idea of this figure to non-mathematical readers: it is contained by six sides, each of which is a parallelogram. Its proportions are not only beautiful in themselves, but they contain a large capacity of contents within small dimensions. As to colour, that is generally a mere matter of fashion, though, probably, red indicates robustness of health, and, in cows, to a certain extent, richness of milk; but there is no rule, as many a Shorthorn breeder will testify. The strangest thing is that, although there is no doubt that the early breeders crossed their stock with the Galloway, and although there is more than a suspicion that the herd of one very prominent Durham-man was indebted for its rugged coat and peculiar horns to the Kyloe, the appearance of a black nose would throw great doubt on the purity of the descent of a modern Shorthorn. We say nothing about the black hair for, of course, they were to canny to cross with any but dun-coloured Galloways and Kyloes, of which there are plenty.

And now comes the question, how did the originators of our new breeds propose to keep up their improved herds, or what was their practical work in the matching of their animals? And this brings before us the whole subject of the two opposite systems—breeding *in-and-in*, and *crossing*; a subject of deep interest to us at all times; but, now that we may expect a permanent demand upon our fields and sheds for meat of good quality for exportation to Britain, it may truly be said to involve the question of riches, or continued poverty to this Province.

Let us see then, in the first place, how Bakewell proceeded. It is notorious that, after he had succeeded in establishing the type he set out in search of, he could never be tempted to make use of a strange animal, however enticing might be its form or quality; he bred entirely from his own stock.

Mr. Booth's reply to the advice of a friend of the writer who had recommended him to introduce foreign blood into his herd was conclusive: "I will, if you will tell me where to find as good." What do we see in the breeding practice of the Collings? Take the before mentioned bull *Albion*, for instance; he was got by a bull who was both the son and the grandson of *Favourite*; his dam was by a son of *Favourite*, and his grandam by a son of *Favourite* out of *Favourite's* half sister!

"Charles Colling's bull *Bolingbroke* and his cow *Phœnix* were brother and sister on the sire's side, and nearly so on the dam's side. They produced the bull *Favourite*, and he, put to his mother *Phœnix*, so nearly related to him on the sire's side, got *Young Phœnix*. To this heifer *Favourite* was again put, and, she being his daughter and his *more than sister*, the calf was—*Comet!*" (2).

Here we have in-and-in breeding with a vengeance! Many a man would say that sterility must ensue, and so perhaps it might if the practice were continued, or if the signs of a falling off in the masculine character of the bulls were neglected. But in the hands of such breeders as I have mentioned there was no fear of this taking place.

(1) Darwin.

(2) Storer—*Comet* was the first "Thousand guinea bull"

Now, the principles of breeding are no longer veiled in mystery, but, from the constant inquiry to which they have been subjected, and from the very high attainments of those gentlemen by whom those inquiries have been conducted, a flood of light has been thrown on the question, and rules have been laid down for the guidance of breeders which, when faithfully followed out, will invariably prove satisfactory.

It seems, then, that the organs and functions of the animal structure are divisible into three great classes, the *locomotive*, the *vital*, and the *mental*. (1)



The locomotive organs are the bones; the ligaments; the muscles. These are connected with the nerves of motion which arise from the *cerebellum*, the back part of the head. The shape, the limbs, and the skin, belong to this class.

The vital organs are the organs of absorption, as the lymphatics; of circulation, as the arteries, veins; the organs of secretion, as the glands. These are connected with the sympathetic nerves, which spring from the *cerebrum*, the fore part of the head. The digestive, respiratory, and reproduc-

(1) Walker's Physiology.

tive organs, with the fat, milk, and other animal products, belong to this class.

The mental organs: the eye, the ears; the organs of perception, and the organs of volition. The functions of the first are to receive impressions from without; of the second, to perceive, compare, reflect; of the third to will, and, consequently, to throw the muscles into action to fulfil its purpose.

Now, the grand purpose of these inquiries is to determine whether or not one parent, or both indiscriminately, impart their organisation to their offspring. And it is to this point that, in spite of its want of attractiveness, we should turn our earnest attention, for it is owing to the indifference with which it has been so long regarded that breeding has been so uncertain an undertaking.

Men of science, after innumerable experiments, have decided that one class of organs is propagated by the male, and another by the female. The whole law may be summarised thus; the dam gives the whole of the nutritive organs, and the sire the whole of the locomotive organs. The thinking organs come in *equal* and *distinct* portions from both parents.

Following out, then, to its fullest limit this doctrine, we see that, if we desire to produce any part of the locomotive organisation in our stock, we shall look for it in vain from the female; if, on the other hand we seek to improve the nutritive system, we should look for it in vain from the male; that is, in simple terms, if we desire, in cattle for instance, an improvement in the shape, we must look to the bull for it, if we want increased production of milk, or increased tendency to fatten, we must look to the cow. So, in breeding sheep, it is the ram who gives the wool, the ewe who gives the tendency to fatten and the increased production of milk.

When we consider that both parents have a share, a distinct and positive share, in the mental organs, it will not be difficult to see why, after a long and injudicious course of in-and-in breeding, all desire seems to be wanting in the male. Suppose the case of a bull breeding with his daughter and again with his granddaughter. Now, he gives, let us say, the anterior organs to his daughter, thus the two animals become, so far, identical; but, in breeding with his daughter, he may give his posterior organs to his granddaughter; and, as the granddaughter will thus bear both his series of organs—the former from the mother, the latter from himself—it is evident that, as regards these organs, the two are perfectly identical, and the identity of the mental organs destroys all desire for reproduction, the differences which are essential to excitement having no existence. (1).

But, although some of our early improvers were, as we have said, obliged, from the nature of the case, to tread a dangerous path, this is no longer the practice of our great breeders. They all have lines of blood, families, of relations it is true, but sufficiently far removed to be matched without fear of the consequences. And it is fortunate for all of us that it is so, for in no other way could the improvement made of late years by *crossing* have been carried out. The effect of adhering tenaciously to a particular family, or line of blood, has been to confer on the male a peculiarly impressive power, by which his form and substance are transmitted to his offspring, the dam contributing, apparently, nothing towards it. In no breed is this so marked a quality as in Shorthorns, probably because in no other case has so much pains been taken to preserve the lines of blood pure and intact. The writer saw at the Hon. M. H. Cochrane's, a few years ago, a calf, by Royal Commander out of a Kyloe heifer that disowned, in every thing but the jolly ruggedness of his roan coat, the very mother who bore him! Hence it is that four crosses of Shorthorn blood are considered enough to admit the produce to Herd-book honours.

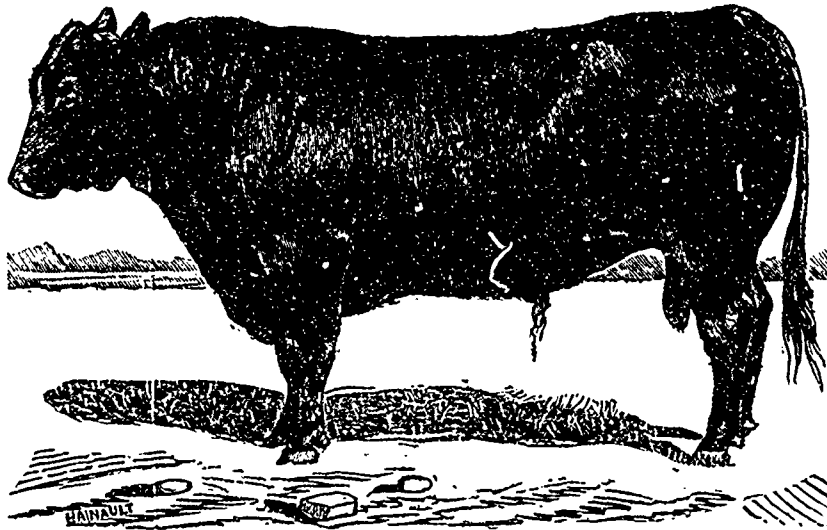
(1) Walker On Intermarriage.

Mr. Booth's Isabella, who was considered by Mr. Berry to be the perfection of a Shorthorn, had only three crosses in her when she and Moss Rose were backed against all the Herfords in England, as a test of the relative excellence of the two sorts. And herein is great encouragement to our farmers. Why cannot a few neighbours club together and buy a pure-bred bull,—Shorthorn, Devon, or Ayrshire, it does not signify what may be their fancy, so long as the animal purchased is pure-bred, and sprung from a carefully maintained herd. We should not dream of recommending our French Canadian farmers to attempt to improve their cattle by crossing with the Shorthorn,—any one who has seen the herds of cows leaving the neighbourhood of St. Hyacinthe in the spring will guess why—but the introduction of an Ayrshire, or Devon bull, would work wonders there. But then we fear as our poor friend W. Carr used to say with all the bitterness his gentle nature was capable of feeling. "It is difficult enough to convince those who have used, and benefited by the use of a high bred sire, of the expediency of continuing in the same course.

Some wretched cross-bred cow put to the "pedigree bull" probably produces a bull-calf like its sire. This is shown at some local shows and wins a prize or two, thus becoming, in his owner's estimation, endowed with every necessary qualification for being a sire. He is then used on his owner's cows as well as on those of his owner's neighbours. The result of this step is soon seen. Interesting traits of the maternal ancestry of the *parvenu* bull reappear in his progeny—the brindle, it may be of Pat. O'Flanagan's Kerry, the black nose and horns of Sandy Macpherson, Kyloo, or the long legs and flat sides of Taffy Owen's Glasgow.

No, it is not the introduction of one bull that will cure the defects of a whole parish of "runts" that when *fat*, as they are said to be, will die in many a case 280 lbs. to 300 lbs. of carcass. The improvement must be kept up for years by the constant introduction of pure blood, and we must confess that we do not see much hopes of the necessary capital, enterprise, and skill, in this province.

ARTHUR R. JENNER FUST.



Galloway Bull.

VETEBINARY DEPARTMENT.

Under the direction of D. McEachran, F. R. C. V. S., Principal of the Montreal Veterinary College, and Inspector of Stock for the Canadian Government.

THE POLLED CATTLE OF SCOTLAND.

Scotland has produced two breeds of polled or hornless cattle. In the South, in the district formerly known as the "Province of Galloway," the breed known as the *Galloways* has been bred and improved for nearly a century and a half. The nature of the soil, the mildness of the climate, and the traditional fame of the stock, have all aided in maintaining this excellent breed.

Many of the landed proprietors retain in their own hands large farms, and give special attention to the breeding of cattle. The thriving Agricultural Societies of the district also, by premiums and otherwise, aid materially in maintaining the breed in perfection.

The Galloways are thus described: "straight and broad in the back, nearly level from the head to the rump, round in the ribs, and also between the shoulders and the ribs, and between the ribs and the loins, broad in the loin without any large projecting hooks, i. e. hip-bones. In the roundness of barrel and fulness of ribs they will compare with any breed,

as also in the proportion which the loins bear to the hook bones, or to the protuberance of the ribs.

Thus, when viewed from above, the whole body appears beautifully rounded. They are long in the quarters and ribs, and deep in the chest, but not broad in the twist. There is less space between the hooks, or hip-bones, and the ribs than in most other breeds, a consideration of much importance as the advantage of length of carcass consists in the animal being well ribbed home, or as little space as possible being lost in the flank. The Galloway is short in the leg and moderately fine in the shank bones. There is no other breed, having the same fineness of shank, so large and muscular above the knee. He is clean and well proportioned about the head and neck. The colour is black, and the skin loose, mellow, and of medium thickness." Youatt.

The excellences of this breed consist in their docility, their easy fattening qualities, and the evenness of the herd. They breed true, and all attempts at crossing them have failed to produce any improvement.

A few herds have been tried in this country. Mr. McCrae, of Guelph, has long been celebrated for his fine breed of Galloways; in this Province, Mr. David Morris, of St. Thérèse, tried to establish the breed, and small herds can be seen at Mr. Hickson's farm at Cote St. Paul, and at Mrs. Greenshields', Lower Lachine.

They are not considered good milkers, although, like all others, an occasional milker will be found among them.

We do not find that they possess any special advantages for our Lower Canadian farms over some of the other hardier and easier fed breeds; nor do we think that they will ever become a popular breed in this Province.

POLLED ANGUS CATTLE.

The breed of black-hornless cattle known as the "Polled Angus" is found in perfection in Angus, Aberdeenshire, and Kincardineshire, in the North-east of Scotland.

They are, thanks to the exertions of Mr. McCombie of Aberdeenshire, considered second to none in points of excellence, especially for form, fattening qualities, and early maturity.

This was shown at the late Paris Exposition where they were awarded the premium over all other breeds exhibited.

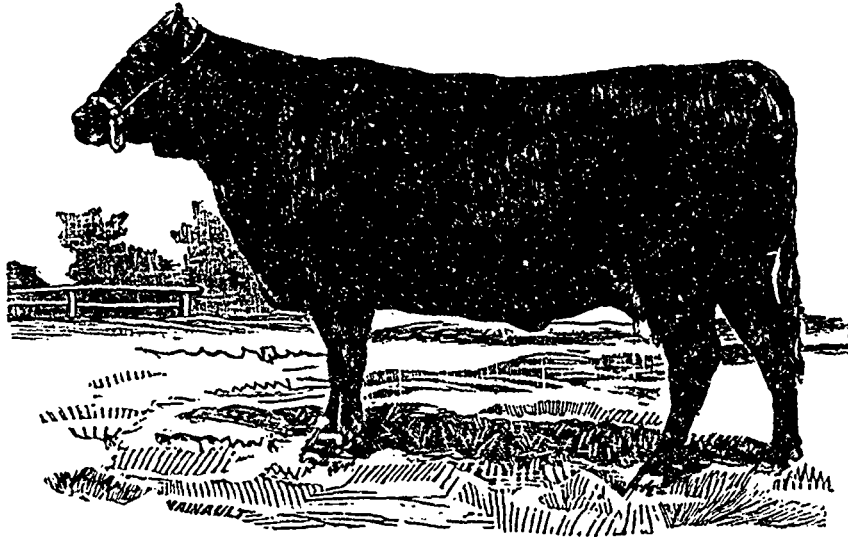
The artificial feeding of modern times has developed, in this breed, a remarkable tendency to fatten. In general appearance, they are very like the Galloways, and even good

judges may mistake the one for the other, but they are larger, the coat is finer, and they are not so robust as the more naturally reared Galloways.

They are beef cattle, pure and simple; for although at one time they were regarded as excellent dairy cows, they have of late years been discarded as such, and their fattening qualities have been developed in a marvellous degree.

They are not a breed suited to our climate. While we consider that the Galloways may do fairly well, we are satisfied that the Angus would not suit our climate, or soil at all.

The Angus "Doddie" was first established in fame, at Smith field, by the late Mr. Hugh Watson, of Keillor. As long ago as 1843, an ox, bred by him won the first prize at the show of the Agricultural Improvement Society of Ireland. It was a most perfect animal, was exhibited at the Baker Street show, in London, by Prince Albert, who bought it, for that purpose, of Mr. Watson, and thence went to Windsor Castle, where, Her Majesty not allowing it to be slaughtered, it remained many years, its health being preserved by gentle exercise in rolling the grass on the "Slopes" with a heavy roller. Any one who has seen the beautiful polled heifers at the Monday's market, at Smithfield, weighing from 85 stones to 100 stones of 8 lbs, has seen beef in perfection. They are, literally, as "round as a barrel."—Ed.



Galloway Cow.

THE REARING OF CALVES.

As the raising of cattle must, in consequence of the recent development of our cattle trade, become a very important consideration for our readers, we trust a few remarks on the best methods of rearing calves will prove of service.

At first thought, it may seem superfluous to offer suggestions on what is usually considered a very simple subject, one with which every farmer is supposed to be familiar; but, the fact is, very few have given the subject that amount of consideration which its importance demands.

Apart from the number of calves which annually die through errors in feeding and mismanagement generally, great losses are incurred by disease, stunted growth, and undeveloped properties of milking or fattening.

Contrast the fate of the poor calf with his more fortunate neighbours the foal, or the lamb. While the latter are left to the careful nursing of the mother, in the full enjoyment of nature's nourishment in its pure and natural condition, allowed to enjoy their youthful gambols in the open air, exposed to the life-giving sunlight, the poor calf is rudely torn from its mother, in most cases as soon as it is born, and

not even allowed to imbibe that medicinal milk intended by nature to act as a mild aperient to cleanse the stomach and bowels of the accumulations of the intra-uterine period. Not only is this the case, but, in most instances, it is, with others, inclosed in confined, dark, and often damp boxes.

The effect of this treatment is to shorten its growth, lessen its vigour, and interfere with its full development.

We do not presume to say that this is universally the custom, but, it is, unfortunately, too often the case.

Breeders under different circumstances have experienced different results from the various methods of rearing calves. Thus, we know some breeders who, under their own direct supervision, have been eminently successful in hand-raising calves, and prefer it to allowing them to suck the mother. Others again, when obliged to trust to servants to attend to their feeding, have been more than disappointed.

Among the breeders of the valuable, high bred Shorthorns, the custom of allowing the cow to suckle her own calf, and often to give it a foster-mother besides, is invariably followed with the best results. By this means greater size, earlier maturity, and the fuller development of the characteristics of the breed, are ensured.

On dairy farms, or on small farms where milk is required for butter or cheese, it is inconvenient to allow the calf to suck the mother, and hand-feeding has to be resorted to, and, properly attended to can be successfully conducted.

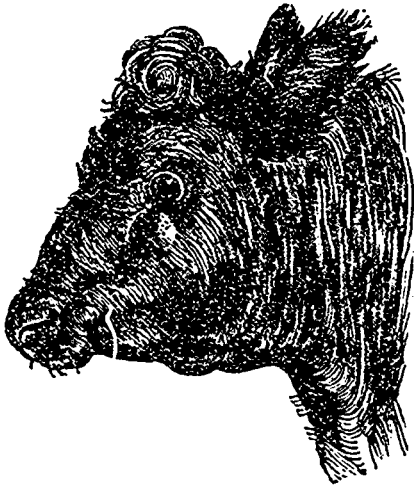
It must be borne in mind that, in the natural state, the young animals have a constant supply of milk in a pure form, at a uniform temperature, and that their stomachs are adapted to the digestion of this fluid, in this condition.

From this we deduce the lesson, that the milk should be given often, and at a uniform temperature, and should be, as nearly as possible, pure

When however it is necessary to remove the butyraceous principles of the milk contained in the cream, we can, in a measure, replace it by the addition of a small proportion of oil cake, or ground linseed. (1)

Owing to the inconvenience of frequent milking, it is customary to feed the calves only three times a day, the consequence is, that they are hungry when fed, and, if allowed, will gorge themselves, and suffer from indigestion in the acute form, producing diarrhœa, which often proves fatal; or, if it assume the chronic form, the animal becomes pot-bellied, wastes away, and, even if it recover, it is with retarded growth, and indifferent health.

Where too many calves are kept together and are fed in open troughs, the strong overcome the weak, and we have an exemplification of "the survival of the fittest." On a recent visit to the dairy farm of Mr. James Drummond at



The head of an Angus Ox.

Petite Côte I was shown a very sensibly planned calf-feeding trough. It consisted of a long trough, divided into spaces for two calves; each calf was secured by his head being placed between two upright posts, one of which is movable and secured by a pin, a plan of securing cattle common enough in many parts of the province; by this contrivance each calf is insured his own share of milk and they are kept secured in this way for a short time after being fed, to prevent them sucking one another's navels; a practice which, in irregularly fed calves, is both common and injurious.

The housing of calves is another very important subject, and one on which many of our farmers are far too careless.

As a rule they are pent up in dark, close, and often damp boxes; any corner where they can be inclosed is thought good enough for the calf. It should be remembered that all life whether it be plant or animal, needs sunshine, therefore let

(1) The difficulty of course lies in the intimate mechanical and chemical mixture, as worked by nature, being, at present, inimicable.—Ed.

them have light. The delicate young creatures require exercise for the development of the different organs and structures of their bodies, therefore they must have room to gambol and play. Damp is highly injurious to all young animals, more especially if the damp is caused by animal fluids from which emanations are evaporating which vitiate the atmosphere, and render it less fit for its important function of purifying the blood, and building up the life springs of the body.

Proper food, at a natural temperature, given often, (if possible not less than four times a day) in not too large quantities, and so given that each calf gets its proper share; abundant of space, light, and air, scrupulous cleanliness, and avoidance of damp, are all requisites for the successful rearing of calves.

GLEANINGS FROM AGRICULTURAL PRESS

A good word for the pig.

The pig has found a defender in the person of Dr. Ballard, who, in a report made some time ago to an English Government Board on the "effluvia nuisance arising in connection with the keeping of animals," said:

When the pig wallows in mire he merely follows an instinct implanted in him in common with some other pachydermatous creatures, the object of which is cutaneous cleansing. The mud stands to him in the relation of soap to a human being; but instead of washing it off with water he allows it to cake and dry upon the skin, and then rubs it all off, mud and cutaneous debris together, upon some sufficiently rough surface. Loose hair and cutaneous scurf irritate him, and he takes his own way of cleansing his skin from them. Cleanse his skin for him and he will rest in contentment, without offending the eyes of his supercilious betters, often less scrupulous in this matter than he is, by his wallowings, scratchings, and scrubbing. It has long been known that a pig thus cleaned with soap and water not only becomes less objectionable, but grows fat more speedily than if left to clean himself in his own way. Similarly as respects his food. Garbage is not the food the pig selects by preference. In fact, a pig which has been fed for any time upon sweet food will turn away from sour and disgusting food. If left to pick up his living where he can find it, he will eat anything he can find that is eatable, but even then will eat acorns, fallen fruit, or roots, in preference to garbage; and human beings in similar straits, will act precisely in the same way. It may be economical, and perhaps even desirable, to convert into pork matters which can in no other way, or in no way more convenient, be made subservient to the subsistence of mankind, and the pig is perhaps properly utilized in this manner. Our only desire is to vindicate his character as a cleanly feeder, if only he has the chance of cleanly feeding vouchsafed him.

The Factory and Farm.

American forests.

Of a desolation recorded far back of even the days of Grecian glory: "A man was famous according as he had lifted up axes on thick trees." In the days when American forests were practically limitless, our fathers were far too famous for lifting up axes on the trees. Trusting to what seemed employment, skilled laborers have made their homes where the streams appeared permanent. Then, as the summers came and went, the river grew more and more feeble till the spindles were silent. Then, the flood turns that stream to a demon of destruction. The cause of all this was that the sources of the river's life have been injured, or destroyed, by men who lifted up axes on the thick trees far up the mountain where the mill streams have their birth.

Next to production in importance, is the question of transportation as involved in navigation. Less than a quarter of the traction is needed to move a ton afloat, that is needed to move it by rail.

Many of the streams constituting Britain's inland navigation are so small as to be spoken of as "brooks" in the Parliamentary acts giving rights to companies to use them. One of these combined canal and river courses takes freight at the southwest of England at the Severn; up historic little Avon; across Wiltshire to the Thames, and up to London. All this will be so improved on that in a few years the speed between steam canal boats and that of the average freight train will be materially reduced. Britain's inland transport lines thus exceed in length her rail lines.

Agriculture does not need sacrifice of trees, to save streams for navigation or manufactures. The identical conditions of rain or dew-fall needed by either is needed for all. Seasons seldom pass in which farmers would not have from one to three fourths added to their yield by a more equal distribution of the rainfall. High culture proves an acre properly watered, may yield as much as seven, or more, treated in the usual ways.

Single trees have been burned in America in log heaps, which, cut into veneers, would sell for more net cash, than the whole farm where it grew. When our forests are as well treated as those of Europe few trees will be cut except by advice of a forest engineer.

GEO. MAY POWELL,
in *Harper Monthly*.

THE PIG.

(American Agriculturist.)

Black or flesh-colored pigs are freest from skin disease in hot climates. The choice is practically between the Essex and Berkshires for males with which to improve the native stock of hardy grubbers of the root-or-die variety. Those who have tried the former have been delighted at first, but after a few years began to recall with longing the lean hams and slim but solid and flavoured bacon of the old race-horse breed. The trouble with the Essex pigs for the south is that they are the eat-and-sleep to sleep-and-wake-to-eat kind, and their grades are, of course, like them. The side fat is superb, and so is the leaf lard, and so far the breed is all that could be desired; but the ham and shoulders are too fat for profit, and the ham is not marbled with fat like the Berkshires. These (the Berks) are much more wide awake, less easily controlled, but good foragers. Their grades are a wonderful improvement upon the original stock, may be made very fat, and yet the proportion between the fat and lean hams, shoulders, and side pork, or bacon, is such as to develop and preserve the excellences of the meat. The hams are large, rich, and juicy, with diffused fat. Berkshires are not quite so easily fattened when penned and systematically fed as the Essex grade, but they will take much better care of themselves in the woods, and when penned, or fastened, for fattening, may be finished off with half the food the original "land pikes" would require.

With many northern and western breeders, the Essex is a more profitable pig than the Berkshire, because his nature leads him to take little exercise, so that all he eats goes to flesh and fat. Respiration, which, if rapid, reduces fat greatly, is with him never accelerated by moving about, and with plenty of food, the sole burden of life is to digest it. This breed is pre-eminent among the black breeds, and excelled by none as fat producers.

POULTRY DEPARTMENT.

Under the direction of Dr. Andres, Beaver Hall, Montreal.

Ground Grain for Poultry.

Observing many Remarks from correspondents about the necessity of having ground oats for poultry feed, and the urgency there is to have them ground *very fine*, I take leave to state, from my own experience, that the contrary does not seem either to affect the appetite of the birds, or to result otherwise that beneficially to their health. Being very fond of poultry, I attend to them personally, and naturally endeavour to preserve them in good condition. Scarcely a book is published, or advice given in our leading journal, that I do not read with care; but it is long since I came to the conclusion that the regimen laid down principally by nearly all was far too strict to be carried out without a vast deal of trouble and expense of time—much more than was actually necessary, and I think has a great tendency to prevent many from indulging in such a healthy and pleasurable pastime.

In the course of my reading I was much taken with the "ground oats" as food, considering when the whole seed was ground up it would be most profitable for a foundation; but how to get this done in small quantities seemed a great difficulty. To order it specially from a mill I should require a much larger quantity than would likely keep sweet for the time required to consume it, so I obtained an ordinary sized cochineal grinding mill, and ground the oats myself. But still I found the difficulty of grinding them so fine as advised; do what I would, the meal when ground was more like chaff. This I was led to believe the fowls would not eat; however, to my surprise, the birds seemed quite delighted with it, and ate all very quickly up. Being mixed in the usual way with water, after a few handfuls of thirds were added to make it into the stiff consistency that fowls prefer their food, after a few days' trial they seem to thrive remarkably well; and when I state that each year I rear from seventy to eighty chickens without scarcely recording a death from natural causes, I am bound to believe that oats and barley ground in this coarse manner are not detrimental to their health. The variety of fowls I keep are Brahas, Spanish, Houdans, and some Bantams. I generally feed with soft food in the morning about eight o'clock, and whole corn in the evening. These two meals seem to satisfy them well. They have a very small grass run outside their pen, to which each lot gets access about two or three hours daily; besides this, they have generally a cabbage put into each run once or twice a week, which keeps them amused. The sleeping house to each run is 5 feet by 7, dry and comfortable; this opens into a covered run, 5 feet by 9. Into each run I have a small flow of water constantly running. This I think of great importance. The grass plot is about 60 feet by 30, a very small space for so many birds; however, it seems amply sufficient. The trouble in attendance is very little. The fowls look well, the cockerels eat well, and the hens lay well, leaving little to be desired. I do not breed for exhibition myself; but a few of my birds which I have been induced to part with brought me very good prices. I believe in having good stock to begin with, and keeping each class quite distinct and separate; a mixed lot of fowls never look well, however fine each individual specimen may be. I should, perhaps, state that I find the corn grind easier by drying it in the kitchen oven the evening previous to using, and when fresh ground, the meal has a sweet and pleasant flavour. Although it has been stated so frequently to the contrary, I suspect other fowls will relish corn ground in the way I describe as much as my own. I am inclined to think the husk of the corn keeps it more open, and not so apt to lie undigested in the crop. "DEEDS SHOW."

[We have used oats coarsely ground ourselves for old fowls, and found it suit them well.]

Fattening Chickens for the Table.

The three prime rules to be observed are, sound and various food, warmth, and cleanliness. There is nothing that a fattening fowl grows so fastidious about as his water. If water any way foul be offered him, he will not drink it, but sulk with his food, and pine, and you all the while wondering the reason why. Keep them separate, allowing to each bird as much space as you can spare, spread the ground with sharp, sandy gravel; and take care that they are not disturbed. In addition to their regular diet of good corn, make them a cake of ground oats or beans, brown sugar, milk, and mutton suet. Let the cake lie till it is stale, then crumble it, and give each bird a gill-measureful morning and evening. No entire grain should be given to fowls during the time they are fattening; indeed, the secret of success lies in supplying them with the nutritious food without stint, and in such a form that their digestive mills shall find no difficulty in grinding it.

Fowl Fattening.

The greatest curiosity in the Jardin d'Acclimation is the singular fowl fattening machine which has been in operation for a short time, but which is a great success (remarks a lady, writing from Paris). Imagine the top of a round tea-table divided off into sections, with a partition between each section and a board in front with a half-moon-shaped aperture in it. In each of these sections an unhappy duck or chicken is confined by a chain to each leg, and under each is fitted a tray, which receives the dirt and is emptied daily. Through the centre of this structure goes a round post, and there is a series of such tea-table tops to the roof of the building, each with its divisions and its imprisoned fowls. At stated intervals a man comes round with a somewhat complicated machine, filled with a kind of thin gruel, and fitted with a pipe at the end of a long india-rubber tube. He introduces this pipe down the throat of a duck, presses down a pedal with his foot, and a certain quantity of food is forced through the tube into the creature's craw, a disc above showing exactly what amount of force he is to use and how much food passes. This process is gone through with each fowl till all are fed, and it is repeated four times a-day for ducks and three for chickens. Two weeks suffice to fatten a duck, but three are necessary for a chicken. Apart from the necessary confinement of the birds, the process does not seem to be at all a cruel one, as the amount of food forced down their throats is not excessive. The ducks which I saw fed did not seem to suffer in the least; and, in fact, when they saw the man approach most of them became clamorous for immediate attention, and plucked at his clothes, as he passed, with eager beaks.

Buckwheat.

Buckwheat is one of the most staple articles of poultry food. It is very fattening, an excellent egg producer, and very much relished by poultry. It is not perhaps used so extensively here as in Europe. In England, France, and especially in Germany, it forms not only an important part of poultry food, but is much used for culinary purposes. The great advantage it has over other cereals is that it thrives luxuriantly even on the poorest land. Those who have not tested its value as a poultry food, we advise to give it a trial. *Poultry Herald.*

Cure of Birds Egg-Bound.

Most of us poultry fanciers, and indeed all of us who pet feathers in any way, whether of small or large kinds, look anxiously to the production of eggs. Those of us who enter the poultry speculation with a special eye to making them remunerative as egg-producers are of course more anxious than others, and care not how speedily the process of return is commenced. Yet, I am not so certain but that this precocity is an evil. Our young stock now are forced on to obtain size for early shows. In the case of the larger breeds, where size is a matter of importance, we are rather anxious to delay the

laying process, and the suggestion, I think, originally thrown out and acted on by our Editor, of removing the pullets from run to run, so as to give them fresh ideas, is very valuable. We all know how a hen in full laying is often checked for days by a fresh place of abode. I imagine this acts still more powerfully with pullets approaching womanhood. It is not all fanciers who possess "runs," at least the word is often applied to places where there is no chance of getting up a run even for life, many even of our exhibition birds being kept in very confined quarters. Of course this is in a degree an artificial life, and as a natural result disease ensues. Where poultry have their full liberty, and, therefore, are more in their natural state, I apprehend such troubles as "egg-bound" are but little known, and are very probably speedily set right; but in our close quarters, and with high-bred stock, the matter is often one of anxiety, which may result in the loss of valuable specimens. The very large double-yelked eggs, sometimes weighing four ounces, of which most of us have seen specimens, are often laid by hens in health, apparently with little more difficulty than those of ordinary size, whilst in many cases of "egg-bound" which I have watched, the eggs have been small, proving that the difficulty lay not so much in the size of the egg as in some deficiency or disorder of the powers that expel it. Not unfrequently it would appear as if the egg were hurried on its course, and the envelope is unfinished; and the egg, sometimes passed with great difficulty, is nevertheless soft and wanting in the hard calcareous shell. If this occur but once at night, and the egg be fully and evenly shaped, only deficient in shell, it may be that fright during the day may be the cause; but if the egg has the smaller end drawn out more or less into a tube, and if this happens frequently, I think the condition is far more serious. If the hen is a valuable bird for exhibition purposes, separate her, feed her on lettuce greens if possible, and soft unstimulating food, with potatoes; at the same time give a dose of castor oil, and follow this up by three or four doses of tartar emetic and calomel—say a pill as follows, made up with bread crumb, tartar emetic, one-sixth of a grain; calomel, one grain. If one of these be given every four hours for three doses, and then twice or three times a day, the process of egg production will probably be arrested, and this is the best thing that can happen to the hen for a week or two; then, when she begins *de novo*, matters may go on more regularly. Breeding stock, especially if in close quarters, are better of the two rather *under* than *overfed*, and many of the difficulties of egg production depend upon this latter condition, especially if the food be too stimulating. A friend of mine for whom I last year bought some Light Brahma pullets, astonished me in February by saying that he had not yet had any eggs. On enquiry I found they were very fat, that they never went off for a forage on their own account in a large field to which they had access, but that, on the contrary, they were always hanging about near the feeding place, and being pets, I have no doubt the tit-bits were many. My reply was, "Aldermanic diet! Give them only two feeds a day, one of soft food, the other hard, and spread it well amongst the grass, and make them look about for it. God intended every living thing, as I believe, to work for its living, if health is to be attained." I have not since heard any complaints. In the earliest days of Brahmas I had a hen, by no means of large frame apparently, yet that turned the scale beyond ten pounds, being very nearly half a pound more; but from this hen I only obtained an egg every third day, and then only by shutting her out during part of the feeding time. Whenever a hen, apparently in laying order, appears with the wings more or less drooping, and with a very slow and measured movement, it is wiser to separate her at once from the others. If on examination the vent is somewhat open, and the bird seems to have occasional

straining, you may suspect that an egg is passing and producing extra distress. You may make yourself certain, if you please, by passing the finger greased into the vent. It may be passed perfectly easy for an inch and a half, and if the finger is directed upward towards the back of the fowl, the hard egg will probably be felt. There is a great satisfaction in this, for it assures one that in all probability, when the egg is passed, the bird will be all right again. If the egg is quite hard, there is little difficulty in detecting it; but if the egg is soft it needs the practised touch. The soft egg is like a rounded elastic swelling, and if it has already received a slight calcareous lining it yields less elastically to the finger, but recovers its form on removal of the finger. Should the hen be much distressed, give a dose of castor oil; if the egg does not pass in a few hours, give a pill of half a grain of powdered opium, and a sixth of a grain of tartar emetic, which may be repeated in five or six hours. This will probably remove the spasm, and the egg will probably be passed. It is wisdom to watch closely for the egg; if it is soft the hen is almost certain to reward herself for her misery by eating it off-hand. Often if the egg is thoroughly formed, the only reason for the delay and misery to the poor bird would seem to be the very rough condition of the shell. In these cases, could we be quite certain of passing a feather oiled into the egg passage, I think it would be most useful; but I confess it to be very difficult if the egg is high up, and almost impossible to give safe directions for the performance. Should the egg be low down, and the egg passage be at all in sight, it may then be possible to pass a soft feather, well oiled round the egg, and it would certainly be useful. I need not say that gentleness is essential. In my early poultry keeping I lost a Minorca hen in laying. The accident happened thus:—She had great difficulty in passing the egg: I was endeavouring to assist her, when a violent effort forced the passage encircling the egg outside, and almost immediately a slit took place, and the egg was forced through at once. The bird seemed very ill after. I had her placed in a basket, fed on soft food, and gave one of the calomel and tartar emetic pills every three or four hours, and the next day she appeared wonderfully better. I had to leave home for some days. The first sight that greeted me as I passed through the yard was the dead body of the poor hen. In this case I suspect that an egg was again forced through, and the result was fatal, but I could not be sure.

Another form of functional derangement which is sometimes seen is when a hen, apparently in good health, and with all the outward appearance of being in full lay, goes to nest regularly, and after squatting there for some time, leaves, cackling her delight; but it is *vox et præterea nihil*—simply a song of triumph—but nothing to show for it. Here, after deciding that the egg is not laid and eaten, which is rarely done without some traces of the misdemeanour appearing, I should put the bird under the same regimen as to food and medicine as if continually passing soft eggs, and arrest the desire to lay. Should the hen get broody, set her by all means; the rest will be most beneficial.

So far as my experience goes, the Polands suffer more in egg production than other fowls. A Poland hen will often exhibit a most deplorable picture, the wings drooping even to the ground, and every movement one of apparent agony. The next day, possibly, she will be perfectly well.

Warminster, England.

JOSEPH HINTON.

Pedigree Breeding.

Many of the queries we receive in all departments of this Journal, and which we endeavour to answer to the best of our ability, while they testify on the one hand to a widely-

spread and fast-increasing interest in the skilled breeding of pedigree stock, prove none the less conclusively that some of the very first principles of that fascinating and profitable pursuit are yet far from being as well understood as they should be. If they were, many of these questions would never be put; if they were, many complaints which reach us of the results of certain "investments" would never be penned, if they were—but we had better stop, for if all our readers were too knowing, what would become of us? But a query we answered privately having specially suggested this subject to us, we have thought that a few brief notes on the subject, continued from week to week as opportunity offers, may be read with interest and not without some profit by many of our friends. If they lead to question and discussion so much the better—and we have little doubt but what they will.

We shall naturally turn to poultry for the chief of our illustrations. It is not only that a long and practical personal experience, in a yard for many years so small that every bird and every fact was brought immediately under our own eye, has made such illustrations the most apt and ready to occur to us, but—as Mr. Darwin himself has remarked in his great work on the "Variation of Animals under Domestication"—the frequency with which fowls and pigeons breed makes investigation and observation in their case much more easy, and results more rapid, than is found with animals which reproduce at longer periods. Hence these very races have always been favourite media of investigation with those who desired to inquire into the phenomena of breeding for definite objects, even without any special interest in them more than in other living creatures. But the facts thus ascertained are general in their bearing, and may be readily applied by an intelligent reader to any other race of animals.

And in the first place, all the facts known to breeders or fanciers tend to diminish very materially the value of any of the specimens so constantly advertised as being vaguely of a "prize strain." Taking this expression at its best, and supposing it to be—as it is not always—honestly used, we may take it to mean that certain animals are the product of others which have won a prize. Some one having won at a certain show, advertises eggs, or chickens, or pups, of his "prize strain;" and we are frequently asked to give our opinion of the value of such. It is not going beyond the truth to assert that such produce may be worth almost any sum; but that it may also be—and is far more likely to be—worth just common market price and no more. And, though this is certainly an extreme case, comparatively seldom to be affirmed, yet still in some cases it is the fact, that the worthless specimens may be descended from parents quite equal in value as show specimens to the ancestors of those which are of the highest worth.

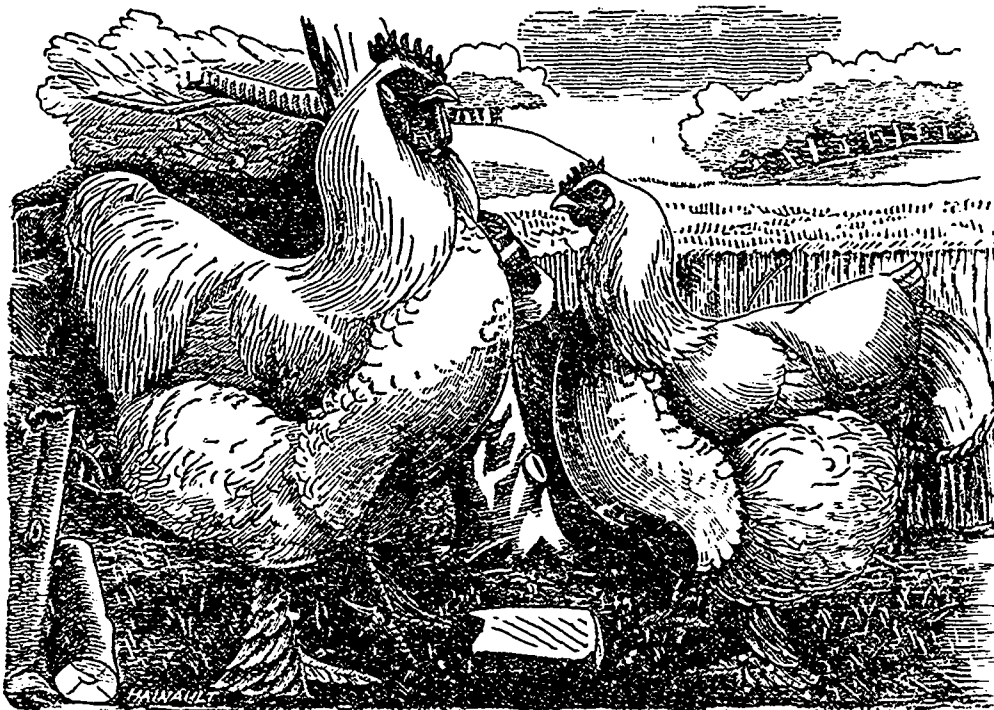
Several reasons for this will at once appear. Supposing any breeding stud to be no more than purely-bred—that is, supposing them, however poor as regards standard features, to be pure Mastiff, or Shorthorn, or Cochin—an almost perfect specimen for the show yard is perfectly possible to occur by chance at any time. They are not of course frequent, but they do occur; and however accidental their occurrence may be, since the judge can only go by what he sees, they are as valuable for exhibition purposes as the best bred specimens in the world. Yet almost every one can see that the produce of such specimens is far more likely to be of the inferior type of the yard from which they accidentally sprung, than to resemble the higher points of the specimens themselves. Again, cross-bred specimens not seldom assume a shape which precisely resembles that of pure breeds; and since breeders know this, and are perfectly aware of the fact that crossing tends, as a rule, to increase size and vigour of constitution, it is not unknown for such cross-bred specimens to be purposely

produced merely for show purposes. This is notoriously the case with certain dogs, and we have seen fowls which were stated and admitted to us to be bred from Dark Brahma cocks and White Cochin hens, which baffled every test we could bring to bear upon them to distinguish from pure-bred Light Brahmas. At the utmost, we might have a faint suspicion, but no more. Yet these again, as almost everyone can readily see, would produce the veriest trash.

Almost everyone, we say, can see so far as this, and even a step beyond, for on further consideration it is readily comprehended that the reason why one set of parents is so much more valuable than another, is simply that one is more or less likely to produce young as good or better than themselves, while the other is not. But few, except practical breeders, have perhaps any clear idea of *why* this is, beyond the fact that the one lot is "from Mr. A.'s yard," or of "Mr. B.'s strain." Observe, not a "prize" strain merely,

but "Mr. B.'s strain." We accentuate the difference purposely, because it is the working out of it that furnishes the clue to the mystery. There is no charm in Mr. B.'s name, it is something he has *done* that makes his stock thus valuable. What is it? We will look a little into this question on the next occasion.

DUCKLINGS.—Whether ducklings be brought out under ducks or hens, the young birds should be kept away from the water until they are from three to five weeks old. This looks as if the advice were unnatural, but three-fourths of the young ducks that are lost in early infancy are killed by cramps and chills from allowing them to rush into cold water before the down upon their skins is thick enough to resist these ill-effects. Ducks are aquatics, but are not marines! Most persons suppose that they belong to the water as fish do. The wild waterfowl have an oily coat that helps to preserve them, while domesticated ducks lose this under home cultivation.—*Fancier's Gazette.*



White Cochins.

White Cochins.

THE COCK.

Head: Rather short and small for the size of the bird; plumage white.—**Eyes:** Pearl, or bright red, and mild in expression.—**Beak,** well curved, stout at the base, rather short; and rich, bright yellow in color.

Comb: Brilliant red, single, firm, rather small, perfectly straight and upright, with well defined serrations, and free from side sprigs.

Wattles and Ear lobes: Wattles; rich red, of medium length, well rounded and fine in texture.—**Ear lobes;** rich red, large, pendant, and fine in texture.

Neck: Short, and neatly curved: hackle; full, flowing well over the shoulders, and, in color, pure white.

Back: Broad, with a gentle rise from the middle thereof to tail, and with saddle feathers very abundant; color, white, and as free as possible from a yellowish tinge.

Breast and Body: Breast; deep, broad and full.—**Body;** deep and round, and, in plumage, clear white, free from any yellowish tinge.

Wings: Small, the primaries well folded under the secondaries, so as to be entirely covered when the wings are closed; the general plumage white, and as free as possible from yellowish tinge.

Tail: Broad, short, soft and full, with the covers numerous, and carried more horizontally than upright; plumage, clear white.

Fluff: Very abundant and soft, covering the posterior portions of the fowl and standing out about the thighs and, in color, white.

Legs: Thighs; very large and strong, and plentifully covered with perfectly soft feathers, which on the lower part, should curve inward round the hock, so as nearly to hide the joint.—**Shanks,** yellow, short, stout, and wide apart, and heavily feathered down the outsides with white feathers:—

Toes, straight, strong, and well sprcad, the outer and middle toes being well feathered.

Carriage : Upright and stately.

THE HEN.

Head : Small and neatly shaped :—Eyes ; pearl, or bright red :—Beak ; well curvcd, short and stout, and rich yellow in color.

Comb : Rich red, single, small, fine, low in front, erect, perfectly straight with small, well defined serrations, and free from side-sprigs.

Wattles and Ear-Lobes : Wattles ; red, small, neatly rounded, and fine in texture :—*Ear-lobes* ; rich red, well developed and fine in texture.

Neck : Short, carried forward, the lower part broad and full, and clear white in plumage, the hackle-feathers reaching well over the shoulders.

Back : Broad, flat and short, with the cushion rising from the middle thereof, and partially covering the tail, plumage, pure white.

Breast and Body : Breast ; broad, full and carried rather low ;—Body ; broad, round and deep behind, and in plumage clear white.

Wings : Small, the primaries well folded under the secondaries, so as to be concealed when the wings are closed : the wingbows neatly covered by the breast feathers, and the points well concealed by the fluff, and, in plumage, clear white.

Fluff : Very abundant and soft, standing out about the thighs, giving the bird a very deep and broad appearance behind, and, in color, clear white.

Legs : Thighs ; abundantly covered with soft, fluffy feathers curving inward round the hock, so as nearly to hide the joint :—Shanks ; yellow, short, stout, wide apart, and well feathered on the outsides, with clear white feathers :—Toes, straight, strong, and well spread, the outer and middle toes being well feathered.

Carriage : Low, with a contented matronly appearance.

SCALE OF POINTS IN WHITE COCHINS.

Symmetry.....	10
Size and weight.....	12
Condition.....	7
Head.....	4
Comb.....	7
Wattles and Ear-lobes.....	3
Neck.....	10
Back.....	10
Breast and Body.....	10
Wings.....	8
Tail.....	7
Fluff.....	5
Legs.....	7

100

Comparisons, in size and weight, 2 points to the pound.

DISQUALIFICATIONS.

Birds not matching in the show-pen ; primary wing-feathers twisted, or turned outside the wings ; twisted combs ; crooked backs ; wry tails ; birds without leg-feathering ; vulture hocks ; legs any other color than yellow ; cocks not weighing nine pounds ; hens not weighing seven pounds, cockerels not weighing seven pounds ; pullets not weighing five and a half pounds.—*American Standard.*

HORTICULTURE.

The Use of the Feet in Sowing and Planting.

We give our full approval, from many year's practice, to the recommendations contained in the following paper

read before the American Association of Nurscrymen at Cleveland, Ohio, June 18, 1879, by Peter Henderson of Jersey City, U. S.

It may be useless to throw out any suggestions relative to horticultural operations to such a body of practical men as is now before us, and yet I candidly admit that, although I have been extensively engaged in gardening operations for over a quarter of a century, I did not fully realize, until a few years ago, the full importance of how indispensable it was to use the feet in the operation of sowing and planting. Particularly in the sowing of seeds, I consider the matter of such vast importance that it cannot be too often or too strongly told, for the loss to the agricultural and horticultural community by the neglect of the simple operation of firming the soil round seed must amount to many millions annually.

From the middle of April to nearly the end of May of this year, in many sections of the country there was little or no rain ; such was particularly the case in the vicinity of New York city, where we have hundreds of market-gardeners who cultivate thousands of acres of cabbage, cauliflower, and celery, but the "dry spring" has played sad havoc with their seed-beds. Celery is not one-fourth of a crop, and cabbage and cauliflower hardly half, and this failure is due to no other cause than that they persist in sowing their seeds without even taking the precaution to firm the soil by rolling.

We sow annually about four acres of celery, cabbage and cauliflower plants, which produce probably five millions in number, and which we never fail to sell, mostly in our own immediate neighborhood, to the market-gardeners, who have, many of them, even better facilities than we have for raising these plants, if they would only do as we do, firm the seed after sowing, which is done thus: After plowing, harrowing, and leveling the land smoothly, lines are drawn by the "marker" which makes a furrow about two inches deep and a foot apart; after the man who sows the seed follows another, who with the ball of the right foot presses down his full weight on every inch of soil in the drill where the seed has been sown ; the rows are then lightly leveled longitudinally with the rake, a light roller is then passed over it, and the operation is done. By this method our crop has never once failed. And what is true of celery and cabbage seed, is nearly as true of all other seeds requiring to be sown during the late spring or summer months.

On July 2nd 1874, as an experiment, I sowed 12 rows of sweet corn and 12 rows of beets, treading in after sowing every alternate row of each. In both cases, those trod in came up in four days while those unfirmed remained twelve days before starting, and would not then have germinated had rain not fallen, for the soil was dry as dust when planted. The result was that the seeds that had been trodden in grew freely from the start, and matured their crops to a marketable condition by fall, while the rows unfirmed did not mature, as they were not only eight days later in germinating, but the plants were also to some extent enfeebled by being partially dried in the loose, dry soil.

This experiment was a most useful one, for it proved that a corn crop sown in the vicinity of New York as late as July 2nd could be made to produce "roasting ears" in October, when they never fail to sell freely at high rates, but the crop would not mature unless the seed germinated at once, and which would never be certain, at that dry and hot season, unless by this method.

The same season, in August, I treated seeds of turnip and spinach in the same way ; those trod in germinated at once and made an excellent crop, while those unfirmed germinated feebly and were eventually nearly all burned out by a con-

tinuance of dry hot air penetrating through the loose soil to the tender rootlets.

Of course, this rule of treading in or firming seeds after sowing must not be blindly followed. Very early in spring, or late in fall, when the soil is damp and no danger from heated dry air, there is no necessity to do so, or, even at other seasons, the soil may be too damp to be trodden upon, or rolled. In such cases these operations may not be necessary at all; for, if rainy weather ensue, the seeds will germinate of course; but, if there is any likelihood of continued drouth, the treading or rolling may be done a week or so after sowing, if it is at such a season as there is reason to believe that it may suffer from the dry, hot air.

Now if firming the soil round seed to protect it from the influence of a dry and hot atmosphere is a necessity, it is obvious that it is even more so in the case of plants whose rootlets are even more sensitive to such influence than the dormant seed.

Experienced professional horticulturists, however, are less likely to neglect this than to neglect in the case of seeds, for the damage from such neglect is easier to be seen, and hence better understood by the practical nurseryman; but with the inexperienced amateur, the case is different. When he receives his package of trees or plants from the nurseryman, he handles them as if they were glass, every broken twig or root calls forth a complaint, and he proceeds to plant them gingerly, straightening out each root and sifting the soil around them, but he would no more stamp down that soil, than he would stamp on the soil of his mother's grave. So the plant in nine cases out of ten is left loose and wagging, the dry air penetrates through the soil to its roots, the winds shake it, it shrivels up, and fails to grow, then comes the anathemas on the head of the unfortunate nurseryman who is charged with selling him dead trees or plants.

About a month ago I sent a package of a dozen roses by mail to a lady in Savannah. She wrote me a woful story last week, saying that, though the roses had arrived seemingly all right, they had all died but one, and what was very singular,

she said, the one that lived was the one that Mr. Jones had stepped on, and which she had thought sure was crushed to death, for Mr. Jones weighs 200 pounds. Now, though we do not advise any gentleman of 200 pounds putting his brogan on the top of a tender rose-plant as a practice conducive to its health, yet, if Mrs. Jones could have allowed her weighty lord to press the soil against the root of each of her dozen roses, I much doubt if she would now have had to mourn their loss.

It has often been a wonder to many of us who have been workers in the soil for a generation, how some of the simplest methods of culture have not been practiced until we were nearly done with life's work. There are few of us but have had such experience; personally, I must say that I never pass through a year but I am confounded to find that some operation can not only be quicker done, but better done, than we have been in the habit of doing it. These improvements loom up from various causes, but mainly from suggestions thrown out by our employes in charge of special departments, a system which we do all in our power to encourage.

As a proof of the value of such improvements which have led to simplifying our operations, I will state the fact that, though my area of greenhouse surface is now more than double that which it was in 1870, and the land used in our florist business one third more, yet the number of hands employed is less now than in 1870, and yet at the same time the quality of our stock is infinitely better now than then.

Whether it is the higher price of labor in this country that forces us into laborsaving expedients, or the interchange of opinions from the greater number of nationalities centering here that gives us broader views of culture, I am not prepared to state; but that America is now selling nearly all the products of the greenhouse, garden, nursery, and farm, lower than is done in Europe, admits of no question, and if my homely suggestions in this matter of firming the soil round newly planted seeds or plants will in any degree assist us in still holding to the front, I shall be gratified.

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On Tuesday, Wednesday and Thursday, the 16th 17th and 18th September next.

All persons residing in this Province may become members of this Society on payment of one dollar annually. Members receive one copy of the report published each year by the Association, a copy of the Agricultural Journal and a ticket of admission to the Exhibition free. All persons desirous of competing must send their entry accompanied by their subscription to the Secretary not later than Thursday the 16th Sept. next. The different Railway and Steamboat Company's will issue return tickets at reduced rates. For Prize Lists and further particulars address—
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