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WHEAT.

Having a very lively recollection of selling wheat at ten shillings and sixpence sterling a bushel, I must confess to a certain penchant for this cereal. I know very well that in this province it is generally regarded as an unprofitable crop. In fact, very few habitans sow more wheat than is necessary to supply their families with flour, and, according to their lights, they are, perhaps, not wrong. You may play tricks with oats, but wheat must be treated carefully; and, in order to succeed with it, the nature and composition of the grain; its habit of growth; and the demands it makes upon the soil, must be thoroughly understood.

Although it may be difficult in some cases to account for the origin of those cereal grasses which afford us our different sorts of grain, there can be no difficulty in arriving at the conclusion that the grain-crops we cultivate are derivatives from different species of wild grasses, produced and maintained by judicious cultivation and selection.

Now, as the grain-crops, which are generally grown here are wheat, rye barley, and oats, I purpose to begin this essay with a few notes on their origin, and, then, I shall proceed to treat more fully of the more immediate subject of the article.

LIST OF GRAIN-CROPS

(a) SPIKES TWO-ROWED.

1. *Triticum vulgare* (common wheat).
2. *Hordeum distichum* (two-rowed barley).
3. *Secale cereale* (rye).

(b) SPIKES PANICULATE OR DIFFUSE.

4. *Avena sativa* (common oat).

Now these four forms of grain are here classified under the names given to the cultivated varieties, but, I shall try to give an idea of their origin, as far as it has been ascertained. I append the following list of the *Genera* whence our grain species have been derived:

WILD NAME.	CULTIVATED OR CEREAL NAME.
1. <i>Aegilops ovata</i> .	<i>Triticum vulgare</i> .—Wheat common to the South of Europe.
2. <i>Hordeum hexastichum</i> .	<i>Hordeum distichum</i> .—Two or six-rowed barley. Native country doubtful.
3. <i>Secale cereale</i>	<i>Secale cereale</i> .—Wild rye. Found wild on the Crimean hills.
4. <i>Avena sativa</i> .	<i>Avena sativa</i> .—Wild oat. Common to Southern Europe.

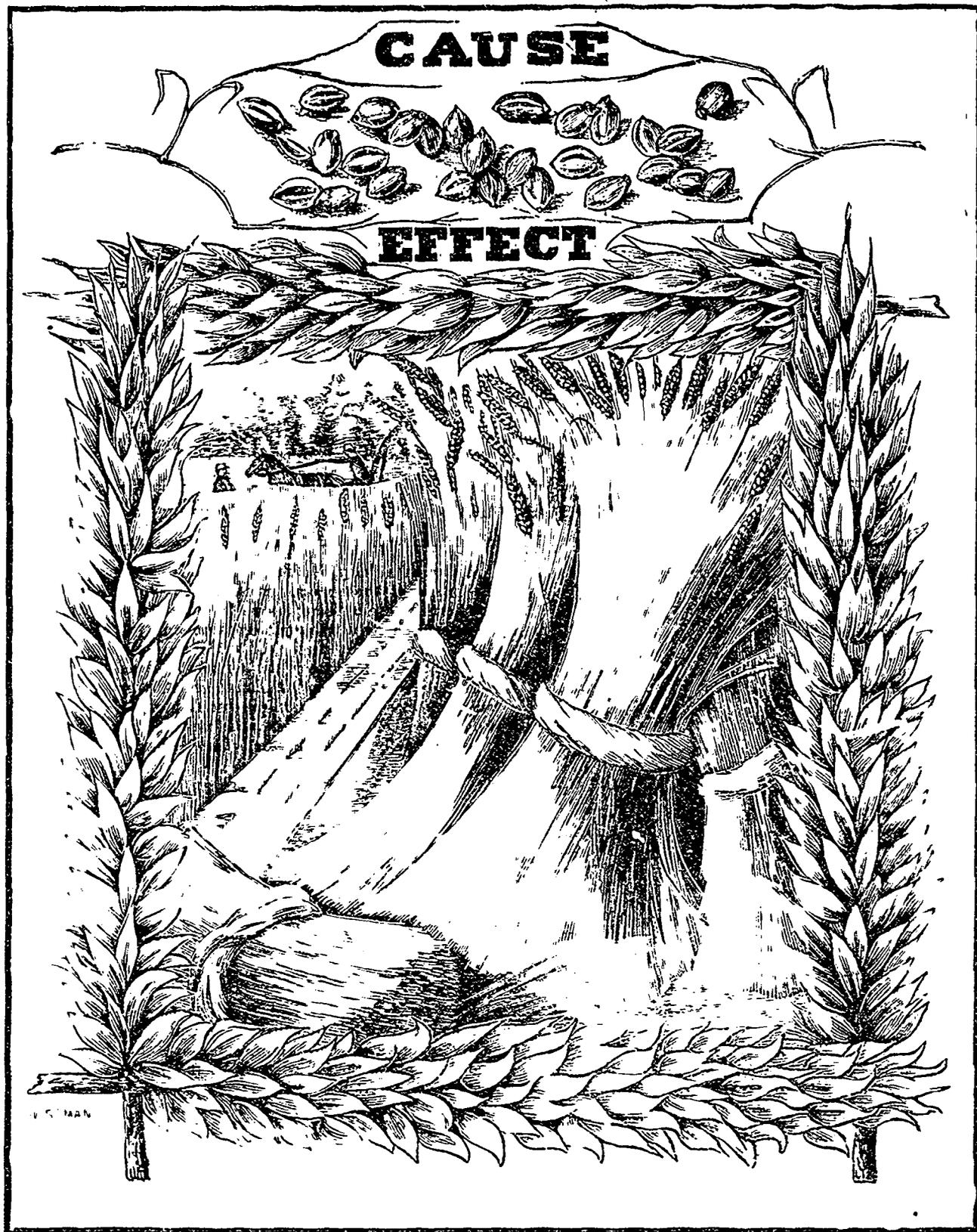


Fig. 1.

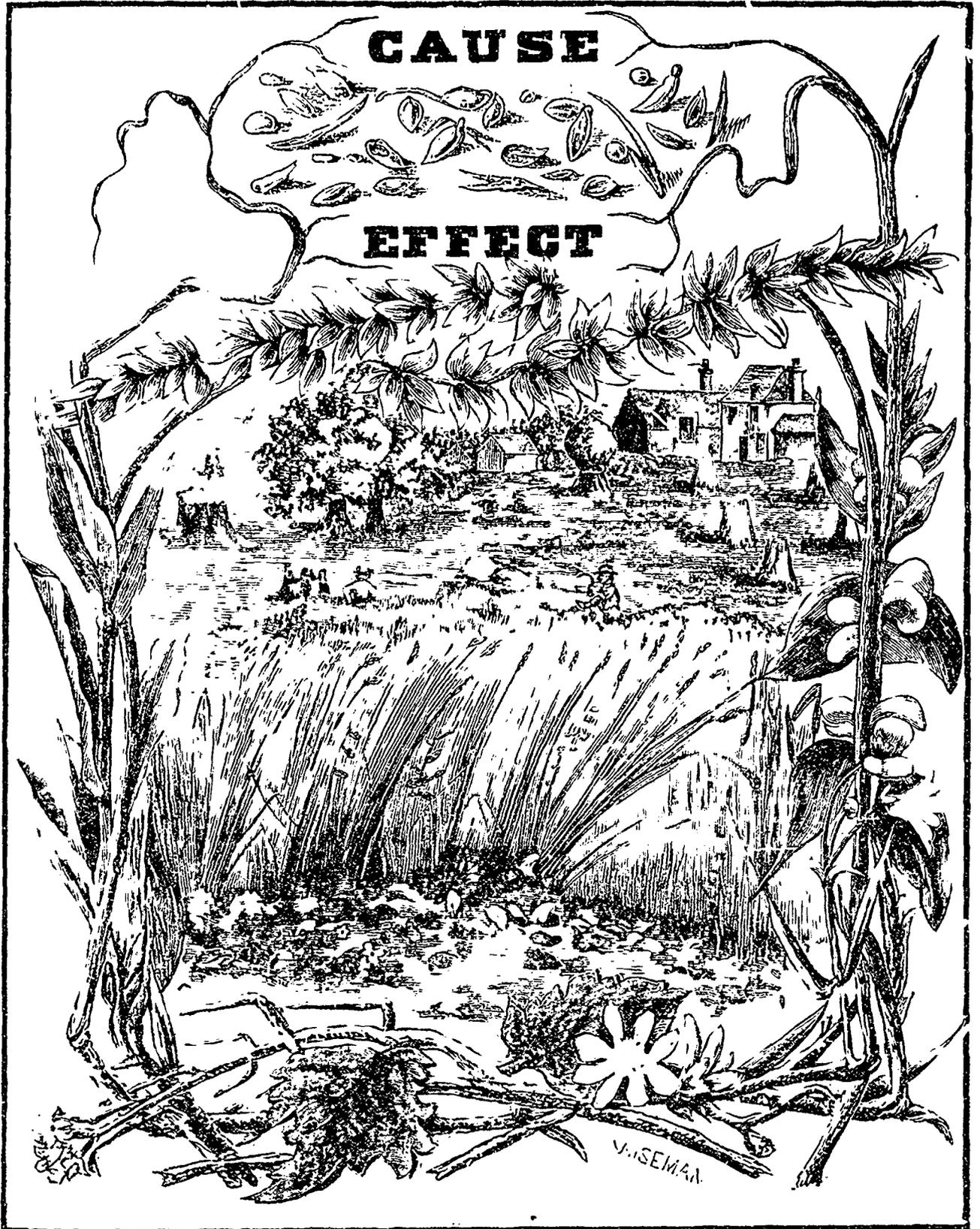


Fig. 2.

It is now some time since M. Esprit de Fabre showed that our cultivated wheat has been derived from a wild grass still to be met with in the South of Europe; and this he did by a series of well-conducted experiments extending over some few years; which experiments were repeated in the trial-grounds of the Royal Agricultural College at Cirencester. I remember M. de Fabre's essay on the subject in the Royal Agricultural Society's magazine, but, in spite of a pretty accurate memory, I dare not quote it from memory, and I cannot find the number containing the article among the file of the magazine in the library of the Montreal Natural History Society: it was published somewhere about the year 1850.

As regards barley, Professor Lindley has written: "*Hordeum distichum*.—This is the only kind of barley that has been found apparently wild. We have now, before us specimens, gathered in Mesopotamia during Col. Chesney's expedition to the Euphrates, with narrow ears little more than an inch long, exclusive of the awns, or four and half inches awns included, and others from the ruins of Persepolis with ears scarcely so large as starved rye." This, perhaps, with from six or eight grains on a side, may, as the results of cultivation, attain to a ear of barley from five to six inches in length, without the awn, and with from seventeen to twenty grains on a side.

As regards rye, the authority just quoted tells us that:—" *Secale cereale*, common rye, is a cereal grass, distinguished from wheat by its narrow glumes and constantly twin narrow florets, with a membranous abortion between them. Otherwise, it is little different in structure, although the quality of its grain is so inferior. According to Karl Koch, it is found undoubtedly wild on the mountains of the Crimea, especially all round the village of Dshimil, on granite, at an elevation of from 5,000, to 6,000 feet.

Seeing then that different kinds of grain are all derived from some wild forms, it follows that the kinds met with on our farms must have been brought to their present state of quasi-perfection by the art and ingenuity of man, exactly in the same way as the Leicester sheep was evolved from the active, penetrating mind of the great breeder of Dishley; and the process, compared with the natural course of production, must have been something like this:

WILD PLANTS—HOW PRODUCED.

In wild nature, the seed of a plant, when ripe, falls near and around the parent stock; or, if scattered by the wind or other causes, it forms a new colony. In these colonies the soil is not prepared, the plants are not thinned, and the result is a wild unimproved plant like the parent.

CULTIVATED PLANTS—HOW DEVELOPED.

The cultivated plant is due to processes of cultivation, as follows:

1. Selection of seed.
2. Keeping of seed in order to sow at an appointed time.
3. To sow in tilled and manured ground.
4. Sowing at stated distances, or thinning out.
5. Keeping free from weeds.
6. Selection of sorts.

The chief points of the standard to be aimed at in the selection and propagation of seed grain are, according to Major Hallett:

1. Hardihood of constitution, or power to resist extremes of climate.
2. Trueness to type.
3. Quality of sample.
4. Productiveness.
5. Power of tillering
6. Stiffness and toughness of straw, to avoid lodging.
7. Earliness of ripening.

And, the effects of careful selection may be seen in the

following tables, extracted from Major Hallett's account of his experiments on wheat near Brighton, Eng.:

Year.	Ears selected.	Height Inches	Con- taining grains	No. of grains from finest stool.
1857	Original ear.....	4 $\frac{3}{4}$	47	..
1858	Finest ear.....	6 $\frac{1}{4}$	79	10
1859	Finest ear.....	7 $\frac{3}{4}$	91	22
1860	Wet season—ears imperfect..	8 $\frac{1}{2}$	123	52
1861	Finest ear.....	8 $\frac{3}{4}$	123	52

Thus, by means of selection alone, the length of the ears has been doubled, their contents nearly trebled and the tillering propensity of the stools increased more than five-fold.

Now, mind, I do not at all feel inclined to recommend every farmer to go to the trouble of selecting his seed-grain year by year. It is not possible, particularly here, where our seasons are so short, and our labour so costly. I only give this table to show what has been done *intensively*, and thereby to incite my readers to take a little more pains in the dressing of their seed-grain. There are many winnowing machine (Scottic's, fanning-mills) that will turn out thoroughly clean samples of grain; some working faster than the others, but in this case pace should yield to perfection of work. Look at the two engravings in the present number. Observe the superb ears in No. 1, and compare them with the thin, faulty ears in No. 2. The ears are by no means exaggerated in size: I have seen many quite as fine, and some still finer. It is unnecessary to say that I do not dream of seeing such wheat grown on our Sorel sands, or on the worn out clays of the St. Hyacinthe country; but wherever a good sound loam is found, like the land on the Island of Montreal, on the sunny slopes of Richmond, or on the kindly terraces of Compton, there, without doubt, a judicious selection of seed, a fair amount of manure, and a wise system of cultivation, will produce a crop with ears approximating, more or less, to those displayed in the engraving No. 1.

KINDS OF WHEAT.—*Nomen illis legio*, their name is legion! Professor Low, of Edinburgh, enumerates eleven different sub-divisions; Lawson, the well known seeds-man to the Highland Society, has described eighty-three varieties; the Museum of the Highland Society contains one hundred and forty-one sorts; and Colonel le Couteur, of Jersey, had in his possession, so long ago as 1836, no fewer than one hundred and fifty varieties. Many of these differ certainly in appearance; but much of the difference is probably derived from the mode of cultivation. For instance: the finest white-wheats, sown on our poor clays in Kent, turn in a few years to brown wheat. Oats, again: the finest sample of Scotch potato oats sown in poor, badly cultivated land, will in two or three seasons become bearded, like the Tartar oat, whereas the original stock has no beard at all; showing, of course, a tendency to revert to the wild oat.

After all said and done, I take it, the best way to classify wheat is to regard the shape of the grain, and the form of the ear, for I know, of my own knowledge, that the usual distinction of bearded and non-bearded, spring-wheat and fall-wheat, are, for all practical purposes, vain. Many bearded wheats lose the beard under improved cultivation, and, as in the case above mentioned of oats, the reverse obtains when cultivated on poor soils and exposed situations. As to spring- and fall-wheat, the names are most misleading; for the Talavera succeeds when sown at either season, and nothing is more common, in my part of England, than to sow fall-wheat in February.

Now, if we look at the four ears of wheat in eng No. 3, we shall see that a considerable difference exists between them : *a* is a close or compact eared wheat, the spikelets being set near each other on the stem (*rachis*). The second class of ear is seen at *b*, the spikelets being of medium length and breadth. The ear is not so broad, but longer than *a*. This, *b*, is the well-known Scotch wheat, Hunter's white. The third class, *c*, is the Talavera wheat, brought from a town of that name in Spain, after the Peninsular war. A loose-looking



Fig. 3.

ear it is, the spikelets set so far apart that the stem is plainly visible between them ; the ear is long but narrow ; and the chaff adheres very loosely to the grain, making it very easy to thresh. At *d*, we have the bearded wheat, such as is generally sown in this province. These bearded wheats are generally distinguished by the long shape of the chaff and the open position of the spikelets, and, consequently, fall under the third class. I have seldom seen so fine a ear of this kind of wheat in Canada as the one figured in the engraving. Here, the boards are usually longer, and the spikelets still more loosely placed on the stem.



Fig. 4.



Fig. 5.



Fig. 6.

The grain of wheat may, as well as the ears, be classed under three heads : the short and plump, the medium-sized, and the large and long form. The first, or short and plump form, is shown in No. 4, where the bosom is distinctly marked, and well filled up. All fine *white* wheat (Talavera may be called *yellow*) belongs to this class.

The second class is represented by fig. 5, where the grains

are long and of medium size. Almost all the red wheats are of this type, such as the Kessingland, red Lammas, Yorkshire creep, &c.

Fig. 6 represents the third form of grain, which is large and long to a greater degree than the last class. The Talavera wheat belongs to this class, and, when once seen, can hardly be mistaken for any other. It has a very valuable propensity, that of early ripening, fields of it in the home-counties of England being often to be seen in stack before any other wheat is fit to cut. Biscuit-bakers value it highly, though it is too valuable to be used for bread : it usually fetches one shilling a bushel more than the best samples of red wheat, and may, as I observed before, be sown in spring or in autumn. Many a poor farmer is indebted to this wheat for the means of getting his harvest in : the steam-engine is set in the field, the shocks carted to the machine, the crop is threshed then and there, and sold on the earliest market-day. In the year 1853, I left home for the Mark Lane market by the 7 a. m. train with a sample in my bag that had been threshed that morning—no dew fortunately—and at 11.30 a. m. I had sold it, winning thereby a bet of £10 that I could sell the earliest lot of wheat in England. Talavera wheat is quite opaque, dull-looking, and indicates not the slightest sign of translucency. Such wheat yields the true pastry-flour ; while the Chidham, a white, partially translucent wheat, is the best suited to the baker's use.

A fair average weight for wheat is 63 lbs. per imperial bushel. I have seen a lot weighing 66 lbs.—after ordinary careful dressing—and at the Great Exhibition of 1851, there was a sack shown, which weighed 68 lbs., and won the first prize ; but it was hand-picked, and so not a fair sample. In some wet seasons, in England, I have found it necessary to kiln-dry wheat. In doing this, great care should be taken, as the slightest smell of smoke would render the wheat unsaleable. No fuel should be used except pure anthracite coal, and if the fire has to be lighted expressly for the wheat, the wood used to start the fire should be thoroughly burnt out before the kiln is loaded. The grain should be at least nine inches deep on the wire or plates, and should not be turned until nearly finished, when two or three quickly succeeding turns will complete the job. In the wet harvest of 1852, I dried about 2000 bushels of wheat in this way most successfully, and the miller to whom I sold it was perfectly satisfied with his purchase—a rare occurrence, I can assure you.

The London millers used to make seven distinct sorts from a grinding or grist of wheat ; as, from a quarter—eight imperial bushels—are derived :

	Bushels.	Pecks.
Fine flour	5	3
Seconds.....	0	2
Fine middlings.....	0	1
Coarse do	0	0½
Bran	3	0
Twenty-penny	3	0
Pollard	2	0
Total.....	14	2½

So that grinding increases the bulk of flour and bran in the proportion of 14½ to 8 of the bulk of wheat. What the new system of rolling or crushing wheat does I know not, as I have never had an opportunity of studying the process ; but I do know that I am using *patent* flour at present which makes most excellent as well as most profitable bread. The yeast is prepared at home, and the whole business goes on as regularly as clockwork : the yeast is set at 10.30 p. m., and

the bread goes into the oven at 10 o'clock a. m. the next day. Brewer's yeast would save time, doubtless, but it is very difficult to get it in any place in the province except in the large towns. I confess to a liking for the slight pleasant bitterness of brewer's yeast bread.

I do not think flour is ever adulterated here, except with potatoes. Alum may be sometimes used, and its detection is easy enough: mash the bread up in water and pour in a few drops of nitrate or muriate of barytes; a heavy white precipitate will follow, indicating the presence of sulphuric acid—alum is a sulphate of ammonia. What is called "unfermented bread" I do not like; it wants flavour, but perhaps you might like to try it and so I give a receipt for it:

Flour	4 lbs.
Super carbonate of soda	5½ drachms.
Muriatic acid.....	℥½ "
Salt	5 "
Water.....	35 oz. about 2½ pts.

Both flour and soda should be carefully sifted and intimately mixed; the salt dissolved in water with the acid, mixed with the flour and soda as quickly as possible, moulded into *small* leaves, and put into a very hot oven. The acid, especially if bought at retail chemists' shops, will be found to vary in strength, so, if the bread is too yellow in colour and tastes of soda, the cure is to use a little more acid the next time of baking.

The cultivation of wheat.—For our present purpose it will be sufficient to divide wheat into two sorts: fall and spring. I need first as to the cultivation of *fall wheat*. In England—except on such high-lying, exposed districts as the Cotswold hills, where the newly sown wheat may be often seen growing by the side of the uncarried wheat of the previous year—in England, I say, the usual time for beginning wheat-seed is the middle of October. In this country, as we all know, much earlier sowing is necessary. The last week in August and the first week in September, will do very well, but a great deal will depend upon the state of the land. Where the cultivation has been perfect, and the land, in consequence, is fitted to start the plant into active life without delay, a week or so later than the time I have mentioned will not be seriously objectionable. There is nothing gained by having your wheat-field look like a meadow in October: rather the contrary, as I have seen fall-wheat in Ontario in mighty danger of rotting in a close, damp November.

Fall-wheat may be sown on land in a variety of states: on a summer-fallow, after early potatoes, on a bastard fallow, after rape, tares or Hungarian grass, and, best of all, after red clover mown for hay. This last condition seldom occurs in this country, as clover is hardly ever sown alone, and when the usual timothy and clover have stood three or four years, oats in the spring would probably pay better than fall-wheat, though I should be puzzled to say, theoretically, why.

There is one point to which I wish to draw your particular attention: wheat *must* invariably be sown on a stale furrow. Even on a summer fallow, the seed should not be committed to the ground until it has lain undisturbed for at least a fortnight. I need not describe the method of treating a fallow; it is enough to say that the last ploughing should be given by the 15th of August. Solidity is the point aimed at, and the gradual settlement of the soil during the interval of from fifteen to twenty days, will tend more to produce the desired condition than all the rollers in the world.

Quantity of seed per acre.—This will of course depend materially on the state in which the land is at seedtime, as

well as on the quality of the soil by nature. Heavy land requires more seed than light land, rough land requires more seed than well worked land, and poor land more seed than rich land. The reason for the last is clear enough, though pure theorists dispute its correctness: on good land wheat will tiller out almost indefinitely; on poor land it will hardly tiller at all.

Again, the quantity of seed used depends upon the mode of sowing: broadcast on the furrow requires most seed, drill-sowing less, and *dribbling*, a system unknown here and too costly with our high-priced labour, requires the least of all. And so I come to the conclusion after a long experience, that more than 2 bushels are unnecessary on broadcast work, and that I should not like to risk less than five pecks with the drill. The finest crop of wheat I ever grew was from one bushel of seed to the acre—drilled at seven inches apart—and I have seen 56 bushels per acre from three pecks; but it is hazardous work, and I should not like to try it again.

How to sow.—Strongly as I advocate the use of the grubber in covering spring grain, I do not advise its use for fall-wheat, and for this reason: we saw that solidity of the seed-bed was of the greatest importance in sowing on the summer-fallow; why then disturb the firmness acquired by the land during its fortnight's repose, by tearing it up with so penetrating an implement? No, the less the seed-bed is disturbed the better. But, still the seed must be buried; sowing on the furrow and subsequent harrowing inter it, at most, an inch and a half; and that will not be deep enough. Where there is a properly constructed drill, with levers powerful enough to hold down the coulters, the seed can be buried three inches deep, and that will suffice; but where there is no drill I prefer ploughing the wheat in. It is a very simple plan: pass the grubber, if there is one, across the ridges; harrow them well lengthways; sow the seed, and plough it in with an eight-inch furrow not more than four inches deep. Do not touch the land till next spring; the wheat will come up in rows, and the combs of the furrows, while protecting the young plant from being bared by the winds of autumn, will moulder down after the departure of the frost, and, in doing so, earth up the roots.

If dung is applied to the fall-wheat, it should be spread and ploughed in early, for nothing is more injurious to the plant than the hollow left by the rotting of the dung. I see in the States they roll their fall-wheat! A great mistake, I think, as the smooth surface refuses to retain the snow, blow the wind never so slightly, whereas, the combs of the furrows in my plan preserve the roughness of the land, and thereby induce the snow to remain where it falls. From their use of the roller, I presume our friends manure for wheat just before the last ploughing. At any rate the dung should be well rotted for this crop. I do not fancy top-dressing in this climate, though in our light lands in England it is a very successful practice. I should fear the snow melting would wash the best of the dung into the ditches. All artificial manures, too, except, perhaps, potash, had better be administered in the spring. You will, of course, not neglect water-furrowing, &c., in whatever way you may have performed the sowing.

Bastard fallow.—This is simply a piece of grass-land, pasture generally, which has been broken up after the first grazing is over to be cleaned and prepared for wheat. The treatment of this should be as follows: plough as shallow and as narrow a furrow as possible, provided that the roots of the grass be all undercut; finish the cleaning operations with the grubber, the harrows, and the roller, if necessary, and then, with a 7 inches furrow, lay up the land in ridges (*gather up*, the Scotch call it) of the usual breadth, and sow as directed for a summer-fallow. The land after tares, early

potatoes, or Hungarian grass, may be treated in the same way.

Spring-culture of fall-wheat.—This will depend upon the weather. If the spring opens fair and dry, the sooner you begin to be-devil the wheat the better. We have not much time to spare here, so we cannot go through the various severe operations fall-wheat undergoes in England. There, it is harrowed, rolled, horse or hand-hoed, clod-crushed—all sorts of tyrannical treatment are inflicted upon it. And the strangest thing is, that the more it is interfered with the bigger it grows. In this country we must be content to harrow and roll it; and it is by no means easy, sometimes, to catch the right season for these jobs. The land must not be too wet or too dry: in the former case, it will become steely and harsh, in the latter, the roller will not effect the desired compression. The roller cannot be too heavy; I have mentioned before, I think, that mine weighed all but 4,000 lb., and was as much as four powerful 1,600 lbs. horses could draw. When the two operations are completed, you will see the wheat begin to tiller out, four or five new shoots will push out from each stool, and the broad flags will give you some idea beforehand what the size of the ears will be at harvest. Remember that the lighter the land the heavier should be the roller.

In most cases, it will be necessary to use the wheat of the preceding year for seed, and this will probably escape any attacks from the *smut* disease, but should you be able to get any new wheat threshed in time, it will be preferable as seed, but means must be taken to destroy any taint of this troublesome malady. There are several steeps: sulphate of copper and arsenic are very effective, but as I have known partridges killed in England by eating arsenicated seed-wheat, I do not recommend any poisonous material for the purpose; not that there is any danger of partridge-poisoning here, but what will kill a partridge will kill a pigeon or a chicken. I would use one of two preparations: sulphate of soda (Glauber's salts) and lime; or lime and salt, both of which mixtures are perfectly innoxious, and should be used thus: 1. one pound of sulphate of soda should be dissolved in two quarts of water and sprinkled over four bushels of wheat, which should be dried with recently slaked quicklime; 2. make the four bushels of wheat into a conical heap, on which place a large pail of scaldingly hot water; put a few lumps of quicklime into the pail, which will cause a violent ebullition; the lime-water will flow over the wheat—what remains in the pail should be carefully poured on to the heap, retaining the undissolved lime in the vessel—the grain, having been dusted over with salt, may be turned two or three times, and allowed to dry off. If to be sown broadcast, it may be used at once, but if to be drilled, a day or two should elapse, lest the machinery of the implement be clogged.

The question will probably be asked: Why sow fall-wheat at all? We are not in the habit of doing so, here. Well, my answer is plain enough: because it will pay better than spring-wheat, and because it will save time in the spring and succeeding autumn. It will pay better: long experience makes me certain that in well chosen spots and in well prepared land, fall-wheat, in an average of years, will yield at least one-third more than spring-wheat. It will save time in the spring, because you will have got over that quantity of the work of sowing, &c.; it will save time in the autumn, because between haying and the general harvest, when there is, if ever, an idle time on the farm, the fall-wheat will be ripe, and can be cut and carried before the other grain is ready for the reaper.

Why should we not sow it? Let it answers on the Island of Montreal; if the late Major Campbell of St. Hilaire sowed it for twelve years—successfully too—if his sons continued the practice, with like profit, is there any reason why all of us

who live in the same district—say from St. Hyacinth westwards—should not do the same? The "*quid faciat lætas segetes*"—what makes the grain rejoice—is the same every-where: good cultivation, a fair amount of manure, and, in the case of fall-wheat in our climate, deep sowing, to prevent the alternate frosts and thaws of the spring from drawing out the roots of the young plant.

Spring-wheat.—In my article in the March number of this Journal I dealt so fully with the sowing of all spring-grain, that I need hardly go over it again. As to the quantity of seed required, I should not sow less than two and a half bushels to the acre, unless the land was in very good heart, and the season early, when two bushels might do. My friend, Mr. Lunan, sows three bushels, but he prefers that his wheat should not tiller, wherein we differ *toto cælo*. His idea is, that thick-sown wheat is less likely to be lodged than thin-sown; my idea is, that as the straw of the latter is invariably stouter and tougher than the straw of the former, it is less likely to suffer from heavy rain and wind in its latter days, and even if it be lodged, it has a greater power of raising itself again.

Spring-wheat should be put in deep, though, perhaps, not necessarily so deep as fall-wheat. Still, the deep-sown will resist the heat better than the shallow-sown, and on light soils, the ploughing in plan will be found to answer, if there is no drill. As for harrowing it in after broadcast work, that system ought to disappear altogether; the grubber will bury the seed deeper, and the heavy roller and water-furrowing complete the job.

The reason why I insist strongly upon the necessity of deep-sowing in the case of wheat is the following: wheat has two sets of roots, the *germinal* or seed roots, and the *coronal* or uppermost roots. At whatever depth the seed may be deposited, it stands to reason that, as the depth of the coronal roots is constant—one inch from the surface—if the seed is only put in one inch deep, the coronal and the germinal roots will be so close to each other that they will have no separate influence; but at a depth of three or four inches, they will stand well apart, the coronal roots will be able to put in action their intended office of acting as *gye-ropes* or *stays*, and the plant, besides being able to dive more easily into the food-supplies contained in the subsoil, will be less likely to be drawn out by the alternate frosts and thaws of early spring. It is in every case from these coronal roots that the new shoots—tillering—spring.

A reference to the September number of this Journal, 1879, will show my readers what is meant by the two kinds of root.

ARTHUR R. JENNER FUST.

OUR ENGRAVINGS.

Illustrations of wheat and ears of wheat.—The engravings are referred to in the article on wheat.

De Omnibus Rebus.

In March of the present year, The Revd. Th. Montminy, the Curé of Saint-Agapit de Beauvillage, gave a lecture before the Dairymen's association of Quebec, some passages of which I think are worthy of notice.

After very properly deploring the exodus of so many of our fellow-countrymen to the United-States, and explaining that the spirit of adventure, and the effects of idleness and

debauchery might account for the expatriation of some of them, he goes on to say:

"But these are exceptional cases. The cause, the principal cause of the misfortune that we all lament, is bad farming, that systematic routine, in a word, which brings in its train nothing but indigence to our Canadian families."

M. Montminy then proceeds to enumerate the different means by which the provincial government has endeavoured to cure the evil, such as the appointment of the Council of Agriculture, the Agricultural societies, schools, and exhibitions, &c., and gives his estimate of the success or failure of each in these words:

"The Council of Agriculture, by the confession of several of its members, has not done all the good that was expected of it."

"The Agricultural schools are good. The Director of Agriculture, an eminent practical agriculturist, who has studied the question for thirty years, has only lately proclaimed their usefulness, and is now seeking to obtain greater assistance for them, on condition that they adopt certain suggested reforms."

"The Agricultural societies do not answer our expectation. Their management is so bad, that more than half the grant received by them is wasted. And the same may be said of the exhibitions held under their auspices."

"As regards *Le Journal d'Agriculture*, the government never did a wiser thing than when it distributed the publication gratuitously; and I fear not to say, in spite of the abuse lavished on it, the Journal has done incalculable good. It is a pity the gratuitous distribution has been put a stop to." (1)

"What shall I say of the brave little *Gazette des Campagnes*? In spite of many difficulties it has worked energetically to help the cause of agriculture for more than twenty two years, and, I think has fairly deserved the assistance of government in its useful work."

"A Director of Agriculture has been appointed."

"A good idea, and an excellent director has been selected. Only, after having made the appointment, it would have been wiser to have left greater power of initiating measures in the hands of the officer. The Council of Agriculture ignores his existence, and the constant change of Ministers of Agriculture prevents him from ripening and carrying out his plans. In my opinion, he ought to be, as regards agricultural questions, the chief adviser of the Commissioner of Agriculture."

"There are many reforms demanded in these matters; and first as to the council of agriculture: Should it be abolished? Not so, in my opinion. An improvement might be to appoint the deputy commissioner as the president, and the director as one of the members. It is only these two officers who can give an official stamp to the proceedings of the council."

"The agricultural schools should receive sufficient means to enable them to educate and send out capable farmers and skilful lecturers. A central school of dairy-work should be founded."

"As for the agricultural societies and the exhibitions they hold, more than one half of them either do nothing, or do their work so badly, that no one will deny that they want reforming."

As to the *Journal d'Agriculture* and the *Gazette des Campagnes*, M. Montminy thinks that: "As such large sums are devoted to the cause of immigration, it is hardly worth while to grudge the few thousand dollars which it would cost to support these two Journals, to distribute them

gratuitously, and to pay the editors with sufficient liberality to enable them to devote their whole time and energy to the raising of these publications to the first rank of agricultural papers." A conclusion with which, I need hardly say, I most devoutly agree.

CRIMSON CLOVER.

The *Trifolium incarnatum*, or crimson clover, is one of the most valuable forage plants we possess. Mr. Hicks, of Brunswick county, Virginia, writes as follows to the Rural New-Yorker: "I have full confidence in the hardiness of the plant—that it will withstand the cold at least as far north as New York.—Every farmer here is enthusiastic about it."

Professor Beal, in reply to an enquiry, states that "it seems to be an annual. He has sown it in Michigan, and none of it passed through the winter alive."

Professor Shelton "sowed a small plot of crimson clover in April 1884. It germinated freely, and at first the plants made a vigorous growth, but the summer heat checked it severely, and all the plants were dead by the 1st October."

Just so, it was sown without the slightest idea of the proper season or the proper method of sowing it. Do the learned professors on the other side of the lines never see such a publication as the Journal of the Royal Agricultural Society of England? It is worth while to study it, particularly when there is question of any plant supposed to be new. I do not happen to possess a file of it, but I am sure the numbers of years from 1848 to 1862 must contain many a mention of the crimson clover, and the way to grow it. It will not stand very hard frost, but I have seen it bear some pretty cold winters in England. Mr. Shelton says: "at no time did it make an equal growth with the Red Clover sown at the same time." Of course not, if sown in April, but when sown at the proper time, it beats red clover by ten days.

To sow crimson clover.—When harvest is over, say about the middle of August, take a piece of clean stubble—oats, barley, or wheat—harrow it well two or three times, sow twelve or fourteen pounds of crimson clover and roll it down with a heavy roller. If you plough the land, you will get no crop; I should not even dare to use the grubber. A perfectly firm bed is what this plant peremptorily demands.

This clover differs from the red clover in not coming again after mowing, but it is so early, and so full of goodness, that nobody would ever give it up after once trying it. My old farm-tutor, Wm. Rigden, who used to send an immense quantity of green-meat into Brighton for the livery stables, looked upon it as one of his most paying crops. It occupies the land for a very short time, and does not derange the course, as the moment it is cut and carried, the land is ploughed, and sown with turnips. I never saw it made into hay, but as the stem soon hardens, it should be cut for that purpose as soon as the bloom is out. Its proper use, however, is for green-meat.

"Do we not sow our pease too thick?" asks Horticola, in the Rural New-Yorker. Well, that depends. I always sow both pease and French-beans very thickly, because I would rather have a moderate crop of tender pease or haricots than a full crop of hard ones. The thick shade of the one style of sowing makes a great difference in the quality of the crop. And I am by no means sure that the yield is lessened by thick sowing. All our great London market-men who find the seed-pease for the farmers to sow, and covenant to pay so much per acre for the land and labour, insist upon three bushels an acre being put in at 27 inches apart. I take it these dealers know their business pretty well. And farmers

(1) The reverend lecturer speaks of the *Journal* in the singular number!

with us, in England, who grow pease for their hogs &c., sow from three to four bushels an acre, at the same distance apart.

Sulphate of Ammonia.—Here is a luxury for the British farmer! Sulphate of ammonia, containing 20½ per cent of nitrogen, is only fetching £12 stg. a ton, equal to \$54 per 2,000 lbs. Nitrogen at 13 cents a pound, eh! Here it is gravely put down in the artificial manure men's list as worth twenty-two cents.

Superphosphate, containing 26 to 28 0/10 of soluble phosphate, is selling at Liverpool and London for £2 11s a ton—about eleven dollars per 2,000 lbs. making soluble phosphoric acid worth a little more than 4 cents a pound. And remember, please, that the phosphate from which this is made comes largely from Canada—is, in fact, our *apatite*. The value given in the list (v. June number of the Journal, p. 92) is ten cents!

Now, then, if we take a fair manure containing 7 0/10 of nitrogen and 13 0/10 of soluble phosphoric acid at the above prices we find that nearly 7 acres can be manured with one ton of it a cost of \$3.78 an acre. Compare the prices of 1882, given below!

LONDON: Sept. 2 1882.—*Manures, &c.*—Bones, raw, £7; do. crushed, £7 10s.; ditto meal, £7 15s.; dissolved, pure, £7; ditto, ordinary, £6 10s.; turnip manure, £6 5s.; *superphosphate*, 25 to 26 per cent., £5; coprolite, Cambridge ground, £3 15s.; ditto Suffolk ground, £3; kainit, £3; salt, £2, Peruvian guano, £9 10s. to £14; chemically treated guano, £13; nitrate of soda, £13 15s. to £14 10s.; *sulphate of ammonia*, £22 to £22 10s. per ton. Sulphuric acid, 80 per cent., ¾d. per lb.—*The London Manure Company*, 116, Fenchurch Street, E. C.

CULTIVATING SMILAX.

As soon as the seeds are ripe, usually about June, the earth is allowed to dry out and the foliage to die. The pot is then turned upon its side in some convenient place in the open air, out of the way, and where it will get no water. About the first of September take the bulbs from the pot and shake the earth from them. To prepare for planting, put a quart or more of broken bones in the bottom of the pot, then fill with soil of about one-half leaf-mould, one-fourth fine sand and one-fourth garden loam, pressing it down firmly with the hand, and filling not quite to the top of the pot. Select the choicest of the bulbs and place them around near the sides of the pot, then cover with earth, but not too deep. Set a trellis firmly in the centre, place the pot where it will get plenty of sun, and water lightly until the plants begin to shoot up. The water may then be increased, but it must not be watered freely until it grows freely. Many make the mistake of watering too much, causing the bulbs to rot. —Mrs. J. W. R., in *VICK'S MAGAZINE* for June.

THE DOVE ORCHID.

Few persons interested in flowers have not heard of the Dove Orchid, or, as it is often called, the Holy Ghost Plant, comparatively few, however, have ever seen it, or have ever seen a good engraving of it. As its fame has gone before it,

it is usually made one of the first selections of those attempting the cultivation of Orchids, and it is not now uncommon where collections of these plants are kept, and its beauty and singularity entitle it to the attention it receives. Its name, *Peristeria*, is from *peristera*, a dove, *elata*, winged, in allusion to the central organs of the flower, which have somewhat the appearance of a white dove with purple dotted wings partly expanded, sitting erect in its nest, with head turned downward as if fondly looking at its young. As the dove is the usual ecclesiastical emblem of the Trinity, this flower has received from the Spanish inhabitants of Central and Tropical America, where it is found, the common name of *Flor del Espiritu Santo*, or Holy Ghost Flower.—*VICK'S MAGAZINE* for June.

CHINESE ROSE WINTER RADISH.

After devouring a liberal quantity of them, the remainder was dug up late in the fall, and those which had attained sufficient size were carried into the cellar. Here I saw a fine opportunity for exercising the beautiful talent for half doing things, which is one of my leading characteristics, so they were unceremoniously thrown in a heap on the cement floor of the cellar, instead of packing them in dry earth or sand, as I should have done. The unfortunate roots, however, seemed determined to return good for evil, so in spite of their cavalier treatment, the centre of that heap, of course some of the outside ones dried up, has produced some of the most tempting looking Radishes I have ever seen. We have eaten some of them this month, March, which looked about as plump as they would if just dug out of the garden. What the Chinese Rose Winter Radish would be, if planted at a proper time in a suitable soil and packed as they should be for winter keeping, I do not know, but think the possibilities are considerable, as I can vouch for their excellence under the most atrocious treatment.—X. Y. Z., in *VICK'S MAGAZINE* for June.

BEGONIA RUBRA.

The foliage was attractive enough in itself to make the plant very satisfactory and well worth growing, but it was magnificent when the clusters of flowers were developed. The bright coral-red blooms, borne on stalks of the same color, formed a most delightful and striking contrast with the foliage. The plant received more admiration from visitors than any other one in my conservatory that winter. It kept growing and blooming, and from that time to this it has never been without flowers on every branch. For a year and a half it has been in constant bloom, and has never shown any tendency or desire to rest. Several times over forty clusters of flowers were counted on it at one time, and each cluster was made up of dozens of individual flowers. The flower-stems are produced at the axil of each leaf. They are long, drooping, and much branched, each little branch or sub-division of the stem bearing several flowers. The general effect of the flower clusters is much like that produced by *Euphorbia Jacquiniflora*, though on a much larger scale. It is seldom that we get a plant in which the attractiveness of flower and foliage is so evenly balanced as in this instance.—From "Some Good Plants," in *VICK'S MAGAZINE* for June.

CEMETERY PLANTS.

I will mention two herbaceous plants that are equally hardy, and also beautifully painted with white and green,

and equally eligible for planting on a grave. First, the variegated Day Lily, *Funkia albo marginata*, which, like the *Kerria*, prefers not to be exposed to the hottest sun, and is unexcelled by any plant in the lovely markings and the graceful Acanthus-like display of the leaves; and, second, the Star of Bethlehem, *Ornithogallum umbellatum*, also lily-like, and common in gardens, with profusion of pure white star-shaped flowers, boldly held up to sun or wind from eleven o'clock till three. It fears nothing, grows anywhere, and is always neat and tidy the summer through.—From "Hardy Foliage Plants," in VICK'S MAGAZINE for June.

STRAWBERRIES.

Some very good practical notes on Strawberries are afforded by correspondents of the *Canadian Horticulturist*, in the May number. In regard to hardiness of flower buds, the following, by W. W. HILBORN, of Arkona, Ontario, is appropriate: "I made a thorough examination of the blossoms and buds last spring after the frost of May 29th (1884) when we had four degrees of frost. On referring to notes taken at that time, I find that Jersey Queen had not yet opened any bloom, but more than one-half the buds were killed. Primo and Mrs. Garfield were just beginning to open with a very large percentage of the unopened buds killed, while Daniel Boone James Vick and Manchester, growing by the side of them were uninjured. Crescent Seedling and Captain Jack are also safe ones to plant."

A great deal was written, last year, for and against a theory that pistillate varieties of Strawberries fertilized by staminate of different kinds bear fruit varying in form to correspond with the forms of the varieties by which they have been fertilized. As very much more on this subject will probably find its way into the press the present season, the following testimony by the same writer from whom we have quoted, should have the weight it is entitled to: "I have had Crescent fertilized with Wilson, Captain Jack, Kentucky, Sharpless, New Dominion, Duncan, Cumberland Triumph, James Vick, Warren, and many others, on different soils, and have watched them very closely for several years, and find that wherever I plant Crescent I always get Crescent fruit, no matter what they have been fertilized with. * * * I have also tested many other pistillate varieties on a more limited scale, and find the above to hold good with all of them.—VICK'S MAGAZINE for June.

CENTRANTHUS.

We miss the beauty and the best effects of very many of the annuals cultivated for their flowers in our gardens, for the reason that the plants are often set singly when they should be in masses, and should display sheets of color instead of the few flowers or heads of bloom that are frequently seen. There is very much to be learned in this respect by the ordinary gardener, amateur, or otherwise. Many flowers that are comparatively insignificant in themselves, have no mean importance when raised in masses. Such a plant is the *Centranthus*, a low-growing annual, with small flowers, borne numerously in large heads. When planted so as to spread over a few square yards in extent the appearance in full bloom is very fine. The pink and white varieties of *C. macropiphon*, as shown in the colored plate of this month, are the best, though there are several other varieties of this species. The *Centranthus* is easily raised by sowing seeds of it in

well prepared soil in spring, and allowing the plants to remain undisturbed, only thinning out as may be deemed proper.—VICK'S MAGAZINE for June.

ROSE BUGS.

It is said that Paris green applied to Rose bushes and Grape vines infested with Rose bugs will kill the insects as surely as it does the Potato bug, when used on Potato plants. The application can be dry, mixed with flour, or land plaster, or in liquid form, mixed with water, and sprinkled on, in the same manner as for the Potato bug. (1)—VICK'S MAGAZINE for June.

THE DRINKING WATER OF VILLAGES.

To secure good pure water for drinking and culinary purposes, cities may have expensive waterworks, but villages of from five hundred to ten thousand inhabitants can seldom afford so great expense; they must rely upon wells, usually from twelve to fifty feet deep. That the water in these wells may be kept pure and sweet it is evident that no filth or organic matter should be allowed to enter and contaminate it. Liquids that filter through the soil soon become purified, but where an opening is made so that a stream passes, but little purification can take place. The roots of trees seeking moisture often find the well several rods distant, and in another direction the privy vault. When these roots decay a direct communication is made between them. Worms and insects, also frequently fill the soil with pores. A stratum of sand or gravel may, and often does, connect wells and cess-pools all over the village. Pure water in the village wells requires that no privy vault be allowed below the surface of the ground. The importance of this point is so great that laws should be made, and enforced, prohibiting the sinking of any such vault. Privies should be placed upon the alleys, and so arranged that ashes or dry earth may be frequently thrown in to deodorize and disinfect them, and that the contents may be frequently and regularly carried beyond the village limits.—D. H. ROBERTS, in VICK'S MAGAZINE for June.

THE HELIOTROPE.

One day the botanist, JUSSIEU, was herborizing on the Cordilleras, when he suddenly found himself inebriated by the most delicious perfume. He looked round expecting to discover some splendid flower, but perceived nothing but some pretty clumps of a gentle green, from the bottom of which little capsules of a faded blue color were detaching themselves. He observed that the flowers turned toward the sun, and he therefore gave it the name of *Heliotrope*. Charmed with his acquisition, he collected some of the seeds, and sent them to the Jardin du Roi. The French ladies were charmed with it, and made of it a floral pet. They placed it in costly vases and christened it the flower of love. From thence it soon spread to other parts of the world, and has everywhere been greatly admired. One day, a very charming woman, who doted passionately on the *Heliotrope*, was asked what she could see in this dull and sombre looking plant to justify so much admiration. "Because," she replied, "the *Heliotrope's* perfume is to my parterre what the soul is to beauty, refinement to love, and love to youth."—MRS. M. D. WELLCOME, in VICK'S MAGAZINE for June.

(1) From what I hear, this insect laughs at Paris green or London purple. Nothing but *Pyrethrum* seems to affect it seriously.

HANDSOME NATIVE PLANTS.

The Botanic Garden, at Cambridge, always has a lesson for the quick eye in its treatment of interesting fresh varieties. A giant *Mesembryanthemum* (acinaciforme,) a small but very graceful native white Orchid, *Cypripedium candidum*, a purple *Aquilegia*, a strong plant with deep green leaves, as if reared in its own mountains, and an exquisite white *Trillium grandiflorum*, all grown in cold houses, show what may be done with our less cultivated plants. The *Trillium* especially deserves to be grown for an early house plant, and will be a grateful addition to Easter flowers.—SUSAN POWER in VICK'S MAGAZINE for June.

HORTICULTURAL DEPARTMENT.

Wintering Geraniums.

A correspondent wishes to know the best way to keep geraniums in a cellar during winter. The treatment must vary according to the condition of the cellar. The practice which is frequently recommended, of hanging the plants up by the roots, exposed to the air, can succeed only in a cellar uniformly cool and but few degrees above the freezing point; and the degree of moisture in the air must be just such as to retain the natural amount in the plants, without being so dry as to shrivel them on one hand or so moist as to cause decay. The plants must be kept as nearly in a dormant state as possible by maintaining a low temperature. There are but few cellars which possess all these requisites, and this treatment is not likely to succeed in most cases.

We have adopted the following mode, which requires little care and answers well. A rather large and well lighted window is double glazed, and a stand is provided on which the plants are placed so as to receive plenty of light. When they are taken up in autumn, nearly all the tops are pruned off, but enough is left for the base of a compact form, with a small portion of the young foliage, say about one-tenth or one-twentieth of the leaves of each plant. They are then planted in moss, in a shallow box, placing the box in an inclined position or with a slope of about forty-five degrees, putting a layer of moss on the lower side, then a row of the trimmed plants and another layer of moss and row of plants till the box is filled. It is then placed in its position on the stand in front of the window. The moss may be kept sufficiently moist by showering it with a watering-pot once a month or a fortnight, as it may require, a warm and dry cellar needing more frequent watering than a damp or cool one. In a warm cellar the plants will make some growth during winter, and as the leaves increase in number they will consume more moisture than at first. If the cellar is quite cool they will remain nearly dormant and the slight moisture from the moss will preserve them from drying up. Moss is much better than damp sawdust, which in its turn is better than soil. In moss, there is no danger of their becoming water-soaked after watering, the natural supply being given off, partly in the form of vapor.

The most convenient size for the boxes is about two feet square and six or eight inches deep but they may be larger or smaller. An early growth is made the next spring by putting them in a hot-bed for a few weeks before planting in open ground. A small portion of a hot-bed will hold a large number placed compactly together.

GARDEN VEGETABLES.

We have received from Robert Manning, Secretary of the Massachusetts Horticultural Society, a printed report of

the discussions of the society which took place on the 11th of December, on the various garden vegetables which have attracted recent attention among the newer and older varieties. B. P. Ware, who opened the discussion, said he was conservative on the subject of new sorts, which do not always maintain their first reputation, after the special care with which they were cultivated has declined. Among the finest squashes he named the Butman, beautiful in color, excellent in quality, a good keeper, desirable for amateurs, but not very productive. The Marblehead is like it, both better than the Hubbard, of which they are sub-varieties, and both moderately productive. The Essex was obtained by crossing the Turban and Hubbard, a remarkable sort, uniting the excellence of the Turban with the keeping quality of the Hubbard. It is a rapid grower, ripens early and may be planted as late as the first of July. President Wilder said the Essex and Hubbard would fill the season. J. J. H. Gregory said the Marblehead squash was brought from the West Indies, and he recommended raising only the best sorts, even if not the most productive. They would be worth mere in the end.

Mr. Ware said that Fottler's Improved Brunswick cabbage is the best early variety, and that Mr. Fottler sold his seed for its weight in gold. It has now run some years and has gained in size and lost in earliness. In Marblehead, where the cabbage is the most important of all farm crops, it was formerly preferred to the Stonemason, but is now less reliable. The last named was introduced some forty years ago by Mr. Mason and afterwards improved by Mr. Stone. It makes solid heads of excellent quality. The American Improved Savoy is an improvement on the old Savoy, having smaller stumps and larger heads. Mr. Gregory said the Stonemason cabbage has one fault—a tendency to rot at the stump.

Tomatoes came under examination. President Wilder said he had tried all the new sorts, and had settled on the Acme and Paragon. Mr. Ware thought these two superior to all others.

As to potatoes, Mr. Ware said that, since the Early Rose was originated and sold for three dollars a pound, and a cow bought with a single tuber, we have been flooded with new varieties. Burbank was highly commended. Early Ohio is earlier than Early Rose and is of fine quality. The Bell is probably the best new sort. Among peas, several members had found the American Wonder the best early dwarf variety, and the Champion of England was the general favorite for a late one. Mr. Gregory said that the John Bull pea has very stocky leaves; pods and peas both very large, and it fills out well. Hancock's Early was the most satisfactory among the hard yellow sorts. Mr. Wilder said Breck's Excelsior is a splendid variety.

It is a source of gratification that the members of this veteran society, who are such able horticulturists, are giving attention to the improvement of the best and most delicious vegetables, and adopting the efficient and prolific mode of obtaining new varieties by crossing.

House Plants.

Those who keep ornamental plants in the windows of their living rooms during winter, frequently incur a good deal of labor in selecting the handsomest bloomers irrespective of their hardiness, or power to withstand dry air or an occasional cold snap a little below freezing. The pansy, for instance, will endure almost any degree of cold to which it would be subjected, and if florists will examine their flower beds before the ground is entirely frozen up, they will see

what plants will bear a smart frost. Some wild plants would make fine winter bloomers for a time; such for example as the Hepatica, which we have seen thrusting its purple flowers, without detriment, up through two inches of recently fallen snow in spring. Some of the early blooming cultivated bulbs, as the Siberian squill and snowdrop, would not be harmed by an occasional cold night. Experiments with different flowering plants, annuals, herbaceous perennials and bulbs, might give lists which would make a supply of winter bloom much easier of attainment with many.

THE SHEEP BUSINESS.

The time to go into a business is when a good many persons are getting out of it. This applies especially to sheep keeping. I am not very old, but I can remember several ups and downs in this business; but the downs only last a short time, and everything gets lovely again very soon. The golden fleece becomes tarnished for a while, but it soon brightens again, and gets as bright and brilliant as ever. Just now sheep are down. Good store ewes are selling in the markets, and can be picked out of droves for \$2.50 to \$4 a head, which may be made to bring a lamb next spring worth more than the cost of the dam, and give a fleece that will pay for their keep, and so stand their owners next summer in just nothing at all. This is not bad for a time when a good many sheep owners are wild to get rid of their sheep, and go into something else not half so good. It is thus very clear that this is a good time to begin to keep a flock. This season of the year is the very best, because it will soon be the breeding time, and one can make suitable arrangements for the next year's lambs. Rolling and even hilly land is the most desirable surface, and limestone gravel that is dry and free from swamps or low wet places is the soil. Fuge pabula lœta! Vergile. Clear running water that is wholly free from marshy banks or borders, or well water, which is preferable, is indispensable, because wherever there are low wet places, there the much to be dreaded liver fluke and the lung worm are to be found, with lung disorders and foot rot; and these are more troublesome than all the other complaints of sheep put together. The great needs of sheep are dry footing, good grass, or other herbage, rather short and sweet than rich and luxuriant; pure water, pure air, and plenty of it, and shelters from rains or snows. (1) With these needed comforts, and close watching to avoid accidents and dogs, sheep will always belie the old Virgilian (2) adage that "they are an unhappy flock," and will pay their way better than any other farm stock. The second necessary is the master, and he who would keep sheep with pleasure and profit must be patient and persevering; careful, thoughtful and watchful; apt to learn and quick to apply what he learns, and endowed with good common sense and foresightedness. More sheep go to the bad because of a neglectful owner, or one whose temper is cross and who scorns little details, than for any other reason. The third necessary is to secure a good lot of sheep start with, and not too many at first. Above all things pure-bred ewes should be avoided. They are more exacting than the native grades; they cost several times as much, the fleece is rarely worth more than that of common sheep, and the lambs are worth no more than those of half-bred sheep. But pure-bred rams are indispensable. For market lambs, the black-faced breeds furnish the bestsires.—*Henry Stewart in Country Gentleman.*

(1) *Ad puteos aut alta greges ad stagna jubelo.* Vergil.

(2) Yes, but, if my memory serves me, Virgil only calls the flock "infelix" when it is living in the miserable country of the "Scythian gentes Maoliæque unda."

A. R. J. F.

GERANIUMS AND PELARGONIUMS.

EDS. COUNTRY GENTLEMAN—If I mistake not, Daisy Eyebright (page 376) is somewhat muddled about these. In a botanical sense, the plants she refers to are not geraniums at all, but all are pelargoniums. Popularly, however, the horse-shoe, ivy-leaved, oak-leaved, rose-scented, nutmeg-scented, and many others not uncommon in cultivation, are called geraniums, and, I think, justly enough, seeing that *Pelargonium* is a genus of the geranium family. Anyhow, geranium as a popular name for a pelargonium is surely as consistent as lemonscented verbenas for *Lippia citriodora*, or yellow day-lily for *Hemerocallis flava*; and certainly not nearly so far-fetched as Christmas Rose for a plant of the crowfoot family, or water violet for a member of the primrose family.

True geraniums, in a botanical sense, are mostly hardy, herbaceous, perennial plants—for instance, our common wild spotted cranesbill; sometimes biennial, as in the case of our wild herb Robert. Besides geraniums and pelargoniums, oxalises, balsams and nasturtiums (*Tropæolum*) among familiar garden plants, hold generic rank in the esteemed geranium family.

Your correspondent says: "They are divided into six species." Those she mentions are only sets of three species, namely, *Pelargonium zonale*, *P. peltatum*, and "scented-leaf," which may mean some one of twenty species of fragrant-leaved pelargoniums. If I mistake not, the "pelargoniums" she refers to what are popularly known as Lady Washington geraniums, (1) and if this is so, then she means the cultivated offspring of *Pelargonium grandiflorum*. And here I would call attention to the fact that the New Life, Black Douglas, l'Elegante, and General Grant geraniums she speaks of are as truly pelargoniums as are any Lady Washington pelargoniums in the country.

W. F.

Glen Cove, L. I.

WHITE PLUME CELERY.

As this new variety has failed with some cultivators, we copy the following favorable report from J. Muir, in the London Garden, which seems to indicate that a moist, cool and shady climate may be best for it, as the green plant whitened late in autumn. It was treated like other celery, but not earthed up:

When planted out, just as they were about 6 inches high, they were quite green, and in August, when large plants, they were also quite green—so much so, indeed, that about that time I had great doubts respecting the American "White" Plume blanching; but in September the centre leaves and stems whitened, and by November the entire plant became perfectly white, and in every way agreed with the American representation of it. The stems are now as tender, and the flavor as good as it possibly could be in earthed-up celery of the ordinary type. The White Plume is, therefore, both novel and valuable. It is distinct from any other celery, and, in my opinion, a great acquisition, as the labor of making trenches for it and earthing it up is saved. These are two important points in its favor, and there is another which I must not forget to point out, viz., that it is never worm-eaten or destroyed by celery pests. Worm-eaten celery and rotten celery, too, are produced in the majority of instances through the earth being put up around the stems; but as this is unnecessary in the case of the White Plume, it is not

(1) Called here, "Royal George"

A. R. J. F.

in any way injured by grubs. I see most of the English seed firms are introducing it this year, and it deserves to find many cultivators.

AGRICULTURAL INDUSTRIES.

Mons. A. Tranchant, a French Civil Engineer, gave a lecture on the 7th May, at Quebec, before a numerous and select audience. Many members of the provincial parliament were present.

The subject chosen was "The Agricultural Industries of the province."

The lecturer began by giving an account of the present state of our agriculture, showing what progress had been made, especially in the introduction of new implements. "He regretted to say that our farmers had not sufficient means to develop a rational system of cultivation. The causes of the trouble were pointed out, as, for example:

The farmers, in general, have too much land, and not being able to employ sufficient labour to cultivate the whole, are obliged to leave great part in a non-productive state.

They do not take sufficient care of their manure.

Winter lasts too long, and, as there is not enough keep for the stock, the farmer sells off almost the whole of it in autumn; hence, they require no labourers from November to May, but in spring and summer they are often in want of hands; thus, the want of employment in winter, induces emigration from Canada, and hinders foreigners from immigration into Canada.

The want of good markets for certain products, prevents the *habitant* from pursuing that wise system of farming which would draw from the soil its greatest possible yield. Hence, the importation of wheat, flour, maize, and cattle, which we ought to be in a position to export ourselves.

And lastly, the science of agriculture is not sufficiently studied and taught, and the sons of our farmers unwisely prefer the liberal professions to the pursuit of agriculture."

After these criticisms, M. Tranchant suggested the remedies to be applied to this state of things, and continued:

"When agriculture suffers, commerce and trade do not prosper; but when agriculture is flourishing, commerce and trade share in her prosperity.

"The lot of merchants and operatives is closely connected with the success and well-doing of the farmer, and the powers that rule should make it their principal duty to foster and develop agriculture.

"So well does the Prime-minister understand this, that he has just introduced a bill containing certain reforms to be made in the act of agriculture.

"The most important clause of the bill is paragraph 3, which compels the agricultural societies to call meetings for the purpose of hearing lectures given by people sent out for that purpose; and, after the discussion of the subjects touched upon by the lecturer, to send reports upon the whole to the department.

"Here, will be a commencement of making the science of agriculture common to all, and a great step in the road of progress it is; but it is not enough for the future; further means to improve the condition of farm-pursuits must be tried. and in order to do this, agricultural industries of all kinds must be started, such as beet-sugar factories, starch factories, malt-houses, (1) glucose factories, and, to crown the whole, manufactories of artificial manures. (2)

(1) Plenty of these already, but a great want of skilled workmen.
A. R. J. F.

(2) Right! But as long as nitrogen and phosphoric acid, the two most important constituents of manure, are kept up to double their real value, the farmers won't use them.
A. R. J. F.

"With these factories in operation, farmers will find a ready market for their products, food for their stock in winter, and the means of rearing more calves, &c., than are reared now. Cheese and butter will be made in winter, there will be more manure, and the land will produce double its present yield.

"The labourer will be in request; he will obtain winter-work in these factories, which rarely start until after harvest; and, thus, the emigration of Canadians to the United-States will be arrested, and the immigration of wealthy agriculturists into our province will be secured.

"The government had better spend less in aiding immigration (especially of such a class as we have seen lately), and devote a fair amount of funds to the encouragement of these factories, and to the information of foreign operatives as to the vast resources of our country, and the profits to be derived therefrom. This would indeed render a great service to the country, and every one would reap his share of the gain.

Not being able in one lecture to pass in review the whole proposed system of agricultural factories, the speaker only enlarged on the principal one, beet-sugar factories, giving with impartiality, and without descending to personalities, the history of the factories established here in 1881.

For four years, at least, M. Tranchant conducted the factories at Berthier and West-Farnham. With that at Coatcook he was perfectly familiar, and he described and accounted for the failure of these three enterprises as follows:

1. The smallness of capital and its wasteful expenditure.

2. The absence of business-knowledge in the directors, and the absence of a good understanding among themselves.

3. The factory-people and the beet-growers did not pull together.

4. The farmers of the Island of Montreal (in 1882) and those of the Chambly district (in 1883) were not paid for their beets.

In spite of these hindrances, M. Tranchant had not the slightest doubt as to the ultimate success of the beet-sugar industry; provided sufficient capital could be invested, and the manufacture intrusted to competent persons, well acquainted with the country and its climate.

M. Tranchant stated that the reports sent into the department by Mr. Barnard, the Director of Agriculture, on the beet-sugar industry in Canada, even before the establishment of the factories, were exact at all points. That no country offers so many advantages for this purpose as ours, seeing that the climate permits of the manufacture being carried on up to the end of April. Fuel, too, is cheaper than in Europe, and labour, in winter, does not cost more than on the continent.

In conclusion, the lecturer hoped to see many of the industries mentioned established next year in the province of Quebec. He was sanguine as to their success, as the government would do all in its power to encourage them.

M. Tranchant had the honour of being received by the Premier, Dr. Ross, commissioner of agriculture, and by M. Brûère, president of the legislative Council.

These gentlemen congratulated him on his exertions, requested him to continue his lectures, and promised to take active measures to promote the success of the agricultural industries of the province.

We trust the lecturer may succeed in his object, and, like him, we have every confidence in the future.

(From the French.)

FEEDING CHICKENS FOR MARKET.

An English paper treats this subject as follows:

Now-a-days it is the custom among many breeders of table

fowls to finish them off with a fortnight's close feeding, which is calculated to increase their weight considerably and give them a flavor which is at the same time rich and palatable. This is done in different ways. Some raise a lot of birds together, picking them up from their runs once a week and shutting them in a house together, where they are crammed with prepared food, which generally consists of ground oats and suet, or fat of even a cheaper kind. The birds manage to digest this soft food very well without exercise, put on flesh rapidly if in good health, and are soon ready, the period being ascertained by the feeder by handling, when they are at once killed. Some birds will not fatten as it is called, although chickens do not really put on much fat at any time, but rather flesh, while if they are kept too long, or their food or drink be allowed to get sour, they sometimes go the other way. There are men in Sussex who are fatteners or finishers by trade, buying up hundreds of young birds from the cottagers and farmers, feeding them at home in the way described, and then killing and plucking them and sending to market. Some of these people do a tremendous trade, especially at those seasons of the year when prices run high. They have the usual advantages enjoyed by middlemen; thus they always know the prices they are likely to obtain for their goods. The salesmen depend upon them, or always endeavor to suit them, because they are compelled to work together with men who really stand in a position as customers to them, or in one which is at least as important. This being the case, the fatterer, whose business is large and money always ready, is depended upon, to a great extent, by the little people in his district, who really breed for him, and are in reality compelled to receive his price. Thus he actually has a good margin which secures him from loss and enables him to do very well indeed. It is safe to say that as a general rule the breeders seldom get the benefit of high figures or anything more than a sensible advance when London prices are very high indeed.

Not very long ago, we were at a farm where many hundreds of birds were bred each year, and a system used which differs something from the above. At about 16 weeks the chickens were taken up and put in rows in little compartments, the floors of which were composed of a few slats of wood, so that the manure could fall through into the drawer beneath, which was sawdusted. In front of each little cage was a trough of wood, into which the soft food was placed, and this was composed of milk and meal boiled, or fine greaves (1) and meal also cooked. It was given in a thin, sloppy state, in order to prevent the necessity of giving water as well; but the birds did well, although some difficulty was experienced in keeping the troughs absolutely sweet. Here some two or three hundred were caged and fed at once, and their places filled up as fast as they were taken out for market.

In France another system is adopted in some places where chickens are fattened by a machine, the invention, we believe, of M. Odèle Martin. A nozzle is put into the bird's mouth, and, with a slight pressure of the foot, a quantity of soft prepared food is forced into the crop. This is, of course, regulated by the length of pressure and the state and size of the bird. Each bird is placed in a similar cage to one of those above named, but it stands on a perch to which its feet are fastened by a trap, and more room is given to admit of its body being grasped by the feeder. In one large machine, however, which the maker has invented, the tiers of cages are placed in a circular form and revolve, the man taking up a position and simply pushing the cages past him as he proceeds. The food used in France is generally buckwheat meal and milk, which is very much relished, and is believed to be

as good as any food which is known. We certainly believe it to be equal to ground oats, both, however, being difficult to obtain in England, although they are about the best foods for the purpose. It is difficult to know why it is the case, but except in Sussex, where ground oats are used—and they are ground up finely, husk and all, and command a good price—they are hardly to be obtained in the country, whereas buckwheat meal is sold by very few persons, indeed. Oats are cheap enough, and so is buckwheat, and if corn merchants won't sell it, we advise feeders to grind for themselves, which they can do now without any trouble, there being plenty of mills in the market suitable for the purpose. It seems strange to us and yet it is true that while breeders neglect such grand foods as the above they will give 50 per cent. more money for compounds which are not one-half their value; but the public like being gulled, and it would perhaps be easier to sell ground oats a little spiced at 20s. than at the usual price. Another good food is maize meal mixed with fine sharps—to give the nitrogen which the maize is deficient in. This is used very largely in the North of England, and is very much appreciated. If a man would succeed with his poultry he must use good food and that fresh. Stale meal is dear because many of its properties have departed; hence meal should be always fresh ground—another example of the value of a mill at home.

DROVER AND COLLIE SHEPHERD DOGS. (1)

EDS. COUNTRY GENTLEMAN—I have learned by observation a few of the merits and defects of the Scotch collie dogs when used for driving live stock, and it seems to me they are of sufficient importance to note down and publish. In England, perhaps chiefly in the central and southern counties, there is a short-tailed, or stump-tailed breed of dogs that has for years, perhaps for centuries, been employed by cattle dealers in driving cattle, though in frequent instances they are used in driving sheep. These stump-tailed drover dogs are from twenty to thirty per cent. larger than the Scotch collies. They are usually black, but frequently have a white stripe in the face, or a white nose, and generally they have white-feet as high up as the dewlows, or higher. In some cases these dogs are of a uniform grey color, with short curly hair, the black dogs in most cases having smooth hair.

From his greater height as well as weight, the English drover dog is much better adapted to driving cattle than the smaller Scotch collie. Being taller, the short-tailed drover has a better chance to pinch the cattle higher up and farther from their hoofs, by which he is in less danger of being kicked on the head. Moreover, his greater weight enables him to "hold fast" in degrees impossible to the smaller collie dog. The drovers are not, perhaps, quite so active in their movements as the collies, but are more effective when driving or penning cattle. Their stump tails, which range from two to six inches in length only do not hinder the dogs in their work. The long brush tails of the collie dogs (so long that they frequently drag on the ground), are often trodden upon by the cattle they are driving, in this way causing hindrance, and often laming or maiming the dog just when his services are most required. As collie dogs are much in use at present in western cattle herding, it may be well to take these facts into consideration.

For sheep, the Scotch collie is a very effective, and perhaps unexcelled, helper. Sheep prefer the higher altitudes for the sake of the sweeter herbage they can gather there. At such altitudes, the winds are frequently prolonged and strong. In

(1) Greaves; the residue of tallow-melting.

A. R. J. F.

(1) "Nec tibi cura canum fuerit postrema." Vergil.

such contingencies the long brush of the collie shepherd dog becomes of service in aiding him to turn around sharp curves. On the high and dry prairie ranges in Western Kansas and Nebraska, and in all localities where sheep can be most profitably raised and subsisted, there is the natural work and the most suitable place for the Scotch collie dog. But on the lower and richer lands in the valleys of England and in America, and on the rich bottom and benchland pastures of the West and Far West, the old-time English drover dog would be the most effective, and therefore the best dog to assist in penning, or driving cattle from one place to another.

J. W. CLARKE.

London, England, Aug. 31.

CANADA'S CATTLE TRADE.

AN INTERVIEW WITH A REPRESENTATIVE LONDON SALESMAN OF CANADIAN CATTLE.

Mr. A. M. Pool, of the old and extensive cattle salesmen firm of Marcus Pool & Sons, West Smithfield, London, England, is at present in the city. Mr. Pool is on his return trip home, having been in the country some weeks, during which time he has made a journey through the Province of Quebec and Ontario for the exclusive purpose of conversing with our cattle raisers and exporters, taking observations on the methods of cattle grazing and acquainting himself with the future of cattle prospects in Canada generally. Mr. Robert Bickerdike, of the Dominion Abattoir and Stock Yards, Montreal, is the firm's representative in Canada, and both gentlemen have worked assiduously together for the organization of the Dominion Cattle Association, lately established. To a STAR representative who waited on him at his rooms, St. Lawrence Hall, Mr. Pool said: "The immediate object of my visit is to lay before the cattle exporters the prospects for the season's export trade. We have more cattle in England than we have had for many years past, and we are threatened with heavy supplies from foreign countries. In the face of this and the present depressed state of trade in England, I fail to see what possible chance there is of obtaining high rates in England for cattle.

"As regards the Canadian cattle which I have seen during my present visit I do not find them inferior in quality to those in preceding years, and this is my third trip of inspection to Canada, but I should like to impress on the exporters the mistake made in paying such high rates for stock as they have done of late years. In order to meet the present prices in England, prime cattle should be bought at no higher than five cents a pound. Freights should also be proportionately lower. In my visit through Canada I do not find the exporters so willing to purchase as they have been in former years. This time last year, there were thousands of cattle already bought for shipment in May and June, and space on ocean steamers was nearly all taken, whereas at the present moment I doubt whether there are altogether one hundred cattle bought for the present season's export trade, and as far as I can ascertain no space is yet taken."

"What about our sheep trade?"

"I fear exporters will not be able to buy their sheep sufficiently low to meet the prices in England. Owing to the very heavy supplies of New Zealand mutton, 20,000 to 30,000 prime carcasses coming on every ship, prices are now lower than they have been for many years past.

"Exporters, in selecting stock, should bear in mind that it costs as much to ship an inferior animal as one of prime quality. The Canadian cattle exported last year were decidedly inferior to those of former years and injured the reputation of Canadian cattle to such an extent that English butchers re-

fused to purchase, saying Canadian cattle "carried no more inside fat than an old cow," and it was therefore difficult for us to dispose even of first class cattle."

"What is your opinion as to our facilities for raising cattle?"

"I am decidedly of the opinion that one has every facility in the Western Provinces for raising the best stock. The quality and variety of grasses and fodder compare well with England or any country."

"What would be the effect on prices of a general European war?"

"It would have very little effect on the price of cattle. Grain and breadstuffs would of course be affected, but war would make no material difference in the price of meat."

Mr. Pool left Montreal Saturday and will sail for England on the 18th. He expresses great confidence in the agricultural future of Canada, especially the western provinces, and says he will continue to visit this country from time to time in the interests of his house.

Important sales of improved stock.

We take pleasure in announcing to our readers, two auction sales of improved stock, the first to take place at A. Mousseau, Esq., at *Berthier en-haut*, on the 20th of October next, when some 35 heads of Ayrshire stock both males and females will be sold, and quite a number of Cotswolds. (See advertisement.)

On the 22nd of October next, two days after the Berthier sale, we shall sell by auction, on our experimental farm at Three-Rivers, some twenty-five heads of *Canadian Jerseys* closely related to MARY ANN OF ST. LAMBERT, etc., and eight Cotswold sheep, bred from stock purchased and imported by the agricultural College at Guelph, Ont. (See advertisement.)

Agricultural societies as well as farmers generally in this province, shall no doubt have at these sales, a good occasion of securing improved stock of the above named breed at reasonable prices.

We hope that this new departure in agriculture, may obtain the encouragement necessary to secure the full success of such sales, so that they may become annual.

E. A. BARNARD,

Director of Agriculture.

AUCTION SALE OF SPLENDID CANADIAN JERSEYS AND COTSWOLD SHEEP.

The undersigned, will sell without reserve, on the 22nd of October next, at his experimental farm, THREE-RIVERS about 25 heads of Canadian Jerseys, from the best types in the world. STOKES POGIS III (the father of MARY ANN OF ST. LAMBERT, which gave 867 lbs. of butter in 11 MONTHS TIME,) is grand sire of the cows that will be sold, and *Albert Rex Alpha*, imported for the herd of Mr. Romeo Stephens of St. Lambert is the father of the calves. It is certainly one of the best Jerseys known.

Also four Cotswold rams, from the magnificent herd of the Agricultural College of Guelph, Ontario.

The sale to commence after the arrival of the noon train at Three-Rivers.

The above stock can be seen, together with *Albert Rex Alpha*, at the farm of the undersigned, at Three-Rivers. Apply to Mr. Thomas Fortin, Chemin des forges. For further details, apply to.

ED. A. BARNARD,

Director of Agriculture,

Quebec.

NON-OFFICIAL PART.

FOUR ACTS PLAYED!

SAD REPORT ABOUT EX-PRESIDENT ARTHUR.

WILL THE FIFTH AND FINAL ACT BE A TRAGEDY

Rochester Democrat and Chronicle.

"Dr. Lincoln who was at the funeral of ex-Secretary Frelinghuysen, says ex-President Arthur looked very unwell. He is suffering from Bright's disease. During the past year it has assumed a very aggravated form."

That telegram is act IV. of a drama written by ex-President Arthur's physicians. In Act I. he was made to appear in "Malaria," of which all the country was told when he went to Florida.

In Act II. he represented a tired man, worn down, walking the sands at Old Point Comfort and looking eastward over the Atlantic toward Europe for a longer rest.

The curtain rolls up for Act III. upon the distinguished actor affected with melancholy from bright's disease, while Act IV discovers him with the disease "in an aggravated form, suffering intensely, (which is unusual) and about to take a sea voyage."

Just such as this is the plot of many dramas by playwrights of the medical profession. They write the first two or three acts with no conception of what their character will develop in the final one.

They have not the discernment for tracing in the early what the latter impersonations will be. Not one physician in a hundred has the adequate microscopic and chemical appliances for discovering bright's disease in its early stages, and when many do finally comprehend that their patients are dying with it, when death occurs, they will, to cover up their ignorance of it, pronounce the fatality to have been caused by ordinary ailments, whereas these ailments are really results of bright's disease of which they are unconscious victims.

Beyond any doubt, 80 per cent. of all deaths except from epidemics and accidents, result from diseased kidneys or livers. If the dying be distinguished and his friends too intelligent to be easily deceived, his physicians perhaps pronounce the complaint to be pericarditis, pyæmia, septicæmia, bronchitis, pleuritis, valvular lesions of the heart, pneumonia, &c. If the deceased be less noted, "malaria" is now the fashionable assignment of the cause of death.

But all the same, named right or named wrong, this fearful scourge gathers them in! While it prevails among persons of sedentary habits,—lawyers, clergymen, congressmen—it also plays great havoc among farmers, day laborers and mechanics, though they do not suspect it, because their physicians keep it from them, if indeed they are able to detect it.

It sweeps thousands of women and children into untimely graves every year. The health gives way gradually, the strength is variable, the appetite fickle, the vigor gets less and less. This isn't malaria—it is the beginning of kidney disease and will end—who does not know how?

No, nature has not been remiss. Independent research has given an infallible remedy for this common disorder; but of course the bigoted physicians will not use Warner's safe cure, because it is a private affair and cuts up their practice by restoring the health of those who have been invalide for years.

The new saying of "how common bright's disease is becoming among prominent men!" is getting old, and as the Englishman would say, sounds "stupid"—especially "stupid" since this disease is readily detected by the more learned men and specialists of this disease. But the "common run" of physicians, not detecting it, give the patient Epsom salt

or other drugs prescribed by the old code of treatment under which their grandfathers and great-grandfathers practiced!

Anon, we hear that the patient is "comfortable." But ere long, may be, they "tap" him and take some water from him and again the "comfortable" story is told. Torture him rather than allow him to use Warner's safe cure! With such variations the doctors play upon the unfortunate until his shroud is made, when we learn that he died from heart disease, pyæmia, septicæmia or some other deceptive though "dignified cause."

Ex President Arthur's case is not singular—it is typical of every such case. "He is suffering intensely." This is not usual. Generally there is almost no suffering. He may recover, if he will act independently of his physicians. The agency named has cured thousands of persons even in the extreme stages—is to day the mainstay of the health of hundreds of thousands. It is an unfortunate fact that physicians will not admit there is any virtue outside their own sphere, but as each school denies virtue to all others, the people act on their own judgment and accept things by the record of merit they make.

The facts are cause for alarm, but there is abundant hope in prompt and independent action.

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This labor-saving machine has proved a success for the past three years. The load with the rack can be elevated to any height required. Thousands are in use in various places. This machine has been awarded all first prizes and diplomas. Beware of infringement. The rack can be raised by a man as well as by horse power. Any party wishing a load-lifter from different parts, who do not know the agent for that district, or any person wishing to buy a "right," will apply to the patentee.

Sargent & Ruddell have combined their respective patents, which will defy competition for the practical use of this celebrated machine. Parties desiring the like would do well to send for circulars before purchasing any rival machines.

WM. SARGENT,
Berkeley P. O., Ont.

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A few choice head of Thorough-bred Ayrshires, male and female from the undersigned's celebrated stock, so much appreciated for its well known milking properties, and which, as such, obtained, twice, the 1st prize at the Ottawa Dominion Exhibition; also the 1st prize for the best herd at Hochelaga County Exhibition for 1884. For particulars apply to

JAMES DRUMMOND, Petite Côte, Montréal.