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NOTICE.—The subscription to the *Illustrated Journal of Agriculture*, for members of Agricultural and Horticultural Societies, as well as of Farmers Clubs, in the province of Quebec, is 30c annually, provided such subscription be forwarded through the secretaries of such societies.—**EDITORIAL MATTER.** All editorial matter should be addressed to A. R. Jenner Fust, Box 109, Lachine, Que.—or to the Director of Agriculture, Quebec.

OFFICIAL PART.

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DE OMNIBUS REBUS.

Box 109, Upper Lachine—December 5th, 1888.

Ensilage.—There is no doubt about one thing connected with ensilage: the silo is the proper place for the second-crop of clover. By some peculiar arrangement of nature, it almost invariably happens that, if the first-crop of clover is made in fine weather, the second is subjected to drenching-rain. In fact, I have very seldom seen, either in England or in Canada, a good stack or bay of second-out clover. As for ploughing it in, we cannot afford to do that; so the silo is just the place for it.

Sorghum.—It seems that the experiments in the manufacture of sorghum-sugar that have been carried on for some time in the United States, have a tendency to show that the extreme variability of the products, owing to climatic changes, deprives the manufacture of all chance of success. The yield

of sugar as compared with the yield of molasses differs widely in different districts, and no definite percentage of sugar can be fixed as being present in a certain amount of sorghum-cane. The cultivation of sorghum for sugar-making purposes may be set down as impracticable.

Spaying cows and heifers.—I have often wondered why the farmers who supply our towns with milk bother themselves with breeding calves. It would surely be wiser to follow the practice of our great London milkmen, who never let cows take the bull, but milk them as long as they give a paying quantity, and then send them to the butcher—and they are not *half-fat*, either. Cows, we know by experience, differ very much in the time they continue to give milk after calving. Some, even if not in calf again, begin to fall off in yield at the end of eight or nine months; some, on the other hand, I have seen keep up a good flow for twice that period. An anonymous writer mentions the following cases as having come under his observation: 1. a cow at Hampstead, near London, that gave milk continuously for seven years, after having her first and only calf; 2. a large polled-Suffolk, which never ceased yielding milk for five years, during which she never calved; 3. a small French cow that gave milk for three years after dropping her last calf; 4. a cow at Dublin, which for four years never dried, and whose yield of milk never diminished more than three pints daily, and that only in the winter months. The morning of the day on which she was slaughtered, she gave her usual quantity of milk.

I am led to this subject by a report just received, from the Veterinary Department of the Missouri Agricultural College, entitled, "Generalities and experiments in spaying cattle." And here I must remark once more that it is really provoking to see how the Stations are wasting their valuable time in going

over the investigation of subjects that have been ransacked from top to bottom years ago in England. So well is it known there, in this case that spayed animals fatten faster than those that are left in their natural state, that at the Xmas fat-cattle show of the London Smithfield Club some 45 years ago, I saw placarded, over the department assigned to "fat cows and heifers," the following proviso: *Not being spayed*; it being considered an unequal contest, that between a spayed and an unspayed cow. What we call in England a Freemartin, i. e. a heifer twin with a bull, was also barred, and for the same reason: 49 free-martins out of fifty not only never breed, but they never even "seek the bull," consequently, as in the case of the spayed heifer, the periodical disturbance of the system does not occur, and the tranquil life the animals lead must tend to an earlier maturity.

By the bye, I wish people would spay those sow-pigs in every litter that they do not intend to keep for breeding frequently, a fat sow is killed when "in season," and the flavour is considerably deteriorated thereby.

The experiments at the Missouri College are only in their infancy, so I do not feel inclined to criticise them too severely, but I must observe that one of the reasons given by M Paquin, the veterinary surgeon, for performing the operation is rather peculiar: "The country," he says, "is overstocked with scrub cattle. The scrub bulls are castrated every year and make good beef and sell at a good profit. But the scrub heifers, unfortunately, are either bred or sold for barely the cost of raising them two or three years.

"In spaying heifers then, we may accomplish two things of financial value to owners and the country at large, viz.: Diminish if not end the production of scrub cattle, (thereby gradually influencing the raising of better stock) and, second, the transformation of practically valueless heifers into valuable beasts for market.

"It is true that, at present, spayed heifers, though they sell incomparably better than open ones, do not yet command quite the price of steers. This it would seem is because they are not what is termed export cattle. But should the country universally spay surplus heifers, and spay young to afford them better and longer opportunity to grow larger and heavier, and thus make to some extent standard beef subjects, why should they not become export cattle? Practical stock men may see some obstacles in the way with which I am unacquainted. But it seems to me that the quality and increase of weight of spayed heifers would tend to that result.

"The operation of spaying is a very simple one: an incision is made in the flank, the ovaries being held in one hand are cut off by a pair of long scissors, with curved blades, held in the other, and the wound is sewn up *loosely*, leaving a small hole at the lowest point to allow the exudation of matter."

As to spayed heifers not being "export-cattle," I cannot understand M. Paquin's statement at all. A "maiden heifer" always fetches the highest price in the English market, and our salesmen there are not such fools as not to know one when they see her.

The language of M. Paquin is barely intelligible in places. If the report is a translation from the French, it is the reverse of what Ménage predicated of Albancour's translation of Tacitus: *C'est comme ma maîtresse, c'est belle mais peu fidèle.*

I should not feel inclined to spay a heifer much before she was six months old, that is, if she were intended for beef; but to secure permanency of milk, the operation should be deferred until the animal has attained its full growth, which generally is completed at the age of four years. She should be at the flush of her milk, as the future quantity yielded seems to depend on the quantity she is giving at the time of the operation. Three or four weeks after calving, appears to be the

time selected by the best vets for spaying. The cow should be in good health, should fast for twenty-four hours before being spayed, and be milked immediately before the operation is performed.

The advantages of spaying milch cows are as follows: 1. the secretion of milk is rendered permanent, 2. the quality of the milk is improved, 3. the disposition to fatten, when desired, is much increased, 4. the quality of the meat is very much superior to that of ordinary cattle.

The Cutaway Harrow.—A misnomer, certainly, of a very valuable implement, an engraving of which my readers will find at p. 182, December number, 1887, of this Journal. It should be called a cutaway-disc cultivator, and is a great improvement on the original disc-pattern, though that did good work, too. Neither of them are suitable to ground full of large stones, as there is always a risk of one getting nipped between two of the discs, when, unless the driver is very wide-awake, a breakage must ensue. But on stone-less clays, or sandy soils, I do not know a better implement for pulverising land after the plough. In using it, I should go over the field twice: first, with the implement set at a very obtuse angle, and the second time, at an angle as acute as the team was equal to. In fact, I think three horses abreast should be employed in the second cultivation, which should be done diagonally across the first work.

A correspondent of the *Country Gentleman* says:

"I sow both oats and rye with the *cutaway*. In the spring I throw the oats upon the ground, and twice going over the land (without plowing) puts in the crop in No. 1 shape. If the ground is quite mellow, it will not do to ride the machine, as the cutting of the six notches into each of the discs converts a disc into a genuine spading machine, and it is liable to spade too deep.

"Its most satisfactory work to me is on the ensilage corn stubble. As soon as the corn is cut off, I scatter broadcast about two bushels of rye per acre upon the soil, and "wheel" it in, finding no trouble to put in five acres per day alone, between milkings. The way the machine will split, dig and uproot the corn stubble is a wonder. The notches in the angles of the discs are ground to an edge, and as they revolve they simply cut and cover. This saves me many a long day's work from ploughing, for with my spring-tooth drags and other cultivators I could not sow rye on the ensilage stubble on account of clogging, without previous ploughing; but now I have a machine that will not clog and fill up with matter, and will dig and turn the soil where my disc would not work. This stubble I go over twice, lengthwise of the rows; then I finish up by going crosswise, but not riding, so as to obliterate the ridges. I have never used the seeding attachment, as I do not, with the amount I sow, think the extra expense and looking after the combined machine would pay me.

"About the 1st of last June, I plowed four acres of last year's millet stubble with the *cutaway*, and sowed to clover, using no nurse crop with it. Even so late as this, I had no difficulty in thoroughly working the soil four and five inches in depth, and the Thomas harrow quickly made a seed-bed as fine as one could desire.

"The draft is much less than that of the ordinary disc-harrow, and I can only explain this on the ground that the friction of the cutting edge is reduced by the notches from 48 inches to 22, which overcomes the sliding cut of the disc, and the angles in the notches being sharpened, they slice off the soil between the spade thrusts, and so take less power."

And, here, I have again to remark that I really believe that the very trifling yield of the grain crop in the States is far more attributable to the neglect of cultivation than either to climate or soil. The business of a grubber or cultivator

is to pulverise the land after it has been turned up by the plough, and thus fit it for the pasture-ground of the roots of the sown plants. Every one will admit that all manures have a tendency to sink deeply into the soil, and no implement except the plough or spade will bring them up to the surface again. A pretty rough state must a field of ensilage present that has been sown with grain after a grubbing with this or any other cultivator! No, bury the corn-stubs with the plough, and then the cut-away tool will complete the preparation of the land, if it be not set to go to deeply, in which case it might bring the stubs up to the surface again: it is in this point alone that the common disc harrow is better than the cut-away, for there is no fear of the former disturbing the stubs and littering the field all over with them.

Mutton.—What with the doubts about the alteration of the tariff of the United States with regard to the duty on raw materials, especially on wool, and the desire for a change of food, the American farmers seem at last to be turning their attention to the production of a sheep that, in addition to its fleece, will yield a carcase adapted to the table. I hear that, at the autumn sales of rams, merinoes were very little sought after. In Ohio, there has been a fair demand for good Down rams, Shropshires and Southdowns being the most in request. A few Oxfords were sold, but no Hampshires, which to me is very strange, as I should have thought a heavy carcase with early maturity would have been an object in a country where *old wether mutton* is a dainty unheard of.

Pease.—Every body likes pease—that is a truism,—but it is strange that, in this country, so few people ever see them in perfection on their tables. They cannot be found at their best in the Montreal markets, for the growers of the few that come there seem determined never to pick them until the pods are quite full, and by that time the pease are over-ripe, hard, even when sufficiently cooked—which takes a long time to do, and mealy. A good pea, well grown on rich land, should almost melt in the month.

The pea is by no means necessarily a garden-crop. Pease do just as well in the field, if the land has been properly prepared. They should be sown regularly in succession every ten days, and the proper kinds should be carefully selected to carry on the picking to the end of the season.

I would not recommend manuring immediately for this crop, for, in our climate, if the season turns out rainy, the plant has a tendency to run too much to haulm, and fresh manuring tends to encourage this fault. I should prefer sowing pease after a manured crop of roots or corn had been taken. The land should be deeply ploughed in the fall, grubbed and harrowed to a very fine tilth in the spring, and the seed sown the very moment the soil is dry enough to work kindly. The early varieties of pease are very hardy: we sow them in England for the London market in October and November, and they stand the winter well. (1) Of course, our winter is a mere trifle compound with that of Quebec, but even in Kent and the neighbouring South-eastern counties we often have 20 to 25 degrees of frost, and that is severer than any cold likely to occur after the land is fit to work here.

The earliest sowings should, in my opinion, be of that wonderful dwarf, *Bliss's American Wonder*.—Fifteen inches apart is room enough for these, and either the Planet Jr. or Mathews' drill will deposit the seed rapidly, and regularly. I prefer sowing pease thickly, for when thinly sown the pods are so freely exposed to the sun that the pease harden before

(1) I hear from England that Bliss' American Wonder is too tender, to stand early sowing.
A. R. J. F.

they nearly attain their proper development. A quart of seed will plant about 150 feet of drill. The only fault I have to find with the American Wonder is—and it is by no means a fault when grown for market—that almost the whole crop ripens together; in order, therefore, to obviate the inconvenience of having too many pease to gather one day, and not enough, three days afterwards, it would be as well to sow a pint or so of *McLean's Little Gem*, or of *Blue Peter*, at the same time as the Wonders.

Stratagem sown the same day as the Wonder will come to picking about ten days after it. This superb pea should be sown in rows three feet apart, and at that distance may be horse-hoed. The Wonder must rest satisfied with hand-hoeing.

Mr. Waldo Brown, in the *Country Gentleman*, recommends Champion of England, and the other marrowfats, to be grown without sticking, or *brushing*, as the Americans call it, but I never saw a crop of pease the haulm of which exceeds three feet worth growing, unless planted at wide intervals—5 to 6 feet—and firmly supported by close sticking. So great is the demand for pea-sticks in England, that it is quite a business for the *woodman* in felling our coppices to get out as many bundles of them as possible.

The Wonders, if in the ground by the end of April, will be fit for picking by about the 20th June, and should be gathered when very young, as like every other early pea, they soon harden.

After the tenth of June, there is very little use in sowing pease. Later than this, they almost invariably mildew and are worthless for the table. I have tried late sowing several times, and have never succeeded.

In cooking pease, boil a small bunch of *mint* with them. The earliest crop should be eaten alone—not with meat,—and only a sprinkle of fine white-sugar added—*no butter*, please. Green-pea soup passed through a *tamie* is good enough for any one, if the stock has been properly prepared, and a dust of that useful condiment, *celery salt*, given just before serving, with a trifle of sugar. We don't feed half as well as we ought to do.

Potato-crop.—The losses by the rot in the States are, I am told, awful. About Lachine, more than one farmer has not taken the trouble to dig his crop. I see no reason why potatoes should not be a dollar a bushel in the spring. They ask a dollar a bag (1½ bush.) now, and not weighed, either!

Jerseys.—The sale of Jerseys at the celebrated Houghton Farm, New-York State, took place on October 25th. Prices ruled low, we are told, and, as far as I can judge, they were about the same as at the principal sales of the same breed in England. Four hundred dollars was the highest sum bid for a bull, and one cow fetched one hundred and eighty dollars. The majority of the other cows brought about seventy or eighty dollars. "Consignments of Jerseys from other farms, which were offered for sale at the same time, were either of cows too old to be attractive, or of young stock in unthrifty condition, which are always hard to sell on a fall market and went very low": so low, that the *Country Gentleman* does not mention the prices! Happy Mr. Reburn! He at least is certain to sell his line of blood for good prices. Mr. Andrew Dawes told me the other day that he wished all his stock were Jerseys, for they paid him much better than the Herefords and Polled Angus. He has a contract to supply ten gallons of cream a day to the Windsor hotel, Montreal. His farmer, Mr. Tuok, tells me that very few of the Jersey calves have suffered from diarrhoea this past season.

Annual reports.—I have of late received several of the

annual reports of the agricultural experiment stations of the different states of the Union. Of these some are fairly concise, while others extend over from 105 pp. to 200 pp., and require a considerable time to be devoted to their study before the marrow can be extracted from the bone. I hope to be able to give a *résumé* of each of them in turn, and to-day I shall begin with The Proceedings of the Ninth Annual Meeting of the Society for the promotion of Agricultural Science.

I hear that a laboratory is about to be established at Quebec, for the purpose of conducting experiments in artificial manures, soils, &c., and I conceive that a general knowledge of the transactions of similar establishments, that have preceded us in the road of investigation, cannot fail to assist us in the direction of our steps.

The society in question was organised, in 1880, at Boston, for the purpose of bringing together those who are interested in the application of science to agriculture, and I observe in the list of the officers for the past and present years the names of some of the best known professors of agricultural science in the States, such as, R. C. Kedzie, of Michigan, E. L. Sturtevant, of New-York, E. M. Shelton, of Kansas, &c. The number of members is limited to fifty, of whom Professor Saunders, of the Central Experimental Farm, Ottawa, is one. Papers are read before the society at its meetings, but a very wise provision is made against the introduction of extraneous matter by the following resolution, passed in 1880: No paper shall be read before the society unless previously presented to the Executive Committee, in full or by abstract, and accepted by them.

Mr. G. C. Caldwell, professor of agricultural and analytical chemistry, of Cornell university, read a most interesting and deeply meditated paper on "The present aspects of the question of the direct utility of the free nitrogen of the air for plant-food."

The readers of this Journal need not be told that, for many years past, Lawes and Gilbert, Boussingault, now, alas, no more, and others, have been trying to solve this important question. Ville, the well-known French agricultural chemist, coolly begs the question, without discussing the arguments of his opponents: "Clover," says he, "draws its nitrogen from the air, therefore the incomplete manure," i. e. superphosphate, muriate of potash, and plaster, which he recommends for the clover plant, "which does not contain nitrogen, is all it requires." v. Crooke's trans., p. 246. Curiously enough, a passage in the report of the North Carolina experiment station, which I only received yesterday, bears a special reference to this statement of Ville's. Mr. Milton Whitney, the superintendent of the station, in describing certain experiments in the management of permanent meadow and pasture, in which large doses of farmyard dung, of kainit, bone-dust, ground and dissolved mineral phosphates, &c., were employed, makes the following observation: It is interesting to call attention to the very luxuriant growth of red clover on all the permanent pasture-plots that received stable-manure, and the marked absence of the clover on the other plots receiving phosphoric acid, kainit, &c., although the same amount of clover-seed was put on each. This effect is so marked that those plots which received stable manure can readily be recognized from any distance that the plots can be seen, from the green of the clover.

Now, in the dressing of stable manure referred to above, there would be probably 350 lbs. of nitrogen, though, of course, only a portion of this enormous amount was available for plant-food at first; still, is it not fair to suppose that the clover found something to suit it in the dung that it did not find in the phosphoric acid, potash, &c., of the artificials, and profited thereby, and if that something was not the nitrogen

what was it? We know that Lawes and Gilbert, of Rothamsted, hold strongly to the view that it is the large native stock of combined nitrogen in the soil that supplies that excess of nitrogen that the leguminous crops can get over and above the amount afforded them by the farmer. The two philosophers confess that it is exceedingly difficult to prove the truth of their theory by chemical analytical data, but it is just as hard for Ville to prove the truth of his theory, and the evidence which Lawes and Gilbert bring forward in the gradual diminution of the amount of nitrogen in their continuous clover fields, very greatly strengthens the position.

I must remind my readers that, at Rothamsted, though clover, sown more frequently than once in eight years or twelve on the ordinary field with the ordinary manuring, refused to grow a crop, when an old piece of garden-ground was sown with that seed the result was very different. Red clover was grown at Rothamsted continuously for 35 years on such a soil without the application of manure. The soil and subsoil to the depth of 18 inches were exceedingly rich in nitrogen, and it was clear that dung in large quantities had been trenched to that depth into the soil.

When I received, some 18 months ago, a communication from Sir John Lawes on this subject, he informed me that, then, the top garden soil had lost an enormous quantity of its nitrogen, but was still very much richer than the farm-land. The subsoil, in fact, contained, even then, much more nitrogen than the surface soil of the farm. But, still, the clover grows, and yields crops as large as, if not larger than, the crops grown on the farm, though they are very inferior at present to those grown in the earlier period of the experiment. Here, then, is evidence that, while red clover has been grown at Rothamsted on land exceptionally full of nitrogen for 35 years successfully; on the farm, it is unsafe to repeat the crop until the period of eight or twelve years have elapsed since the previous crop was grown.

The researches of the French chemists, Berthelot and Joulié, tend to show that operation are going on in the soil itself, which result in a transfer of nitrogen from the free state in the atmosphere to a combined state in the soil, by the action of microbes.

Professor Atwater's experiments were described by him at the Natural History Society's rooms in Montreal in 1882. Pease were grown in burnt sand, supplied with definite quantities of solutions containing nitrates and other necessary plant-foods. Gains in nitrogen were made over and above any known accessible supply of combined nitrogen.

So, nothing is as yet determined on the point, whether the leguminosæ do or do not assimilate the free nitrogen of the atmosphere. Investigations are being carried on in England, France, and Germany, and, sooner or later, we may depend upon it, a satisfactory solution of the question will be arrived at.

The plum curculio.—A very practical paper was read at the same meeting on "the mode of preventing the injuries inflicted by the curculio on plums and cherries," by Mr. Clarence M. Weed. *London purple*, an arsenite, was first selected for spraying the tree; the powder being used in the proportion of one-half pound to fifty gallons of water. The first application was, on eight cherry-trees, made May 15th, just after the petals had fallen, and before the calyxes had fallen from a large proportion of the fruit. Heavy rains fell on May 18th, and the application was repeated on the 21st. It rained again on 25th, and the trees were again sprayed on the 26th for the last time, though heavy showers fell on the 26th and 27th. Other trees were left unsprayed, and the results arrived at seem to be that the spraying saved 75.8 per cent. of the fruit.

Lime was tried as a spray, in the proportion of a half-peck

to fifty gallons of water, on five cherry-trees. The percentage of benefit was 40.3.

In order to ascertain whether there was any danger to health in eating fruit after the spraying with such a poisonous material as London purple, specimens of the fruit, clipped off carefully with scissors, were sent to Professor Weber for analysis, and no trace of arsenic was found on them.

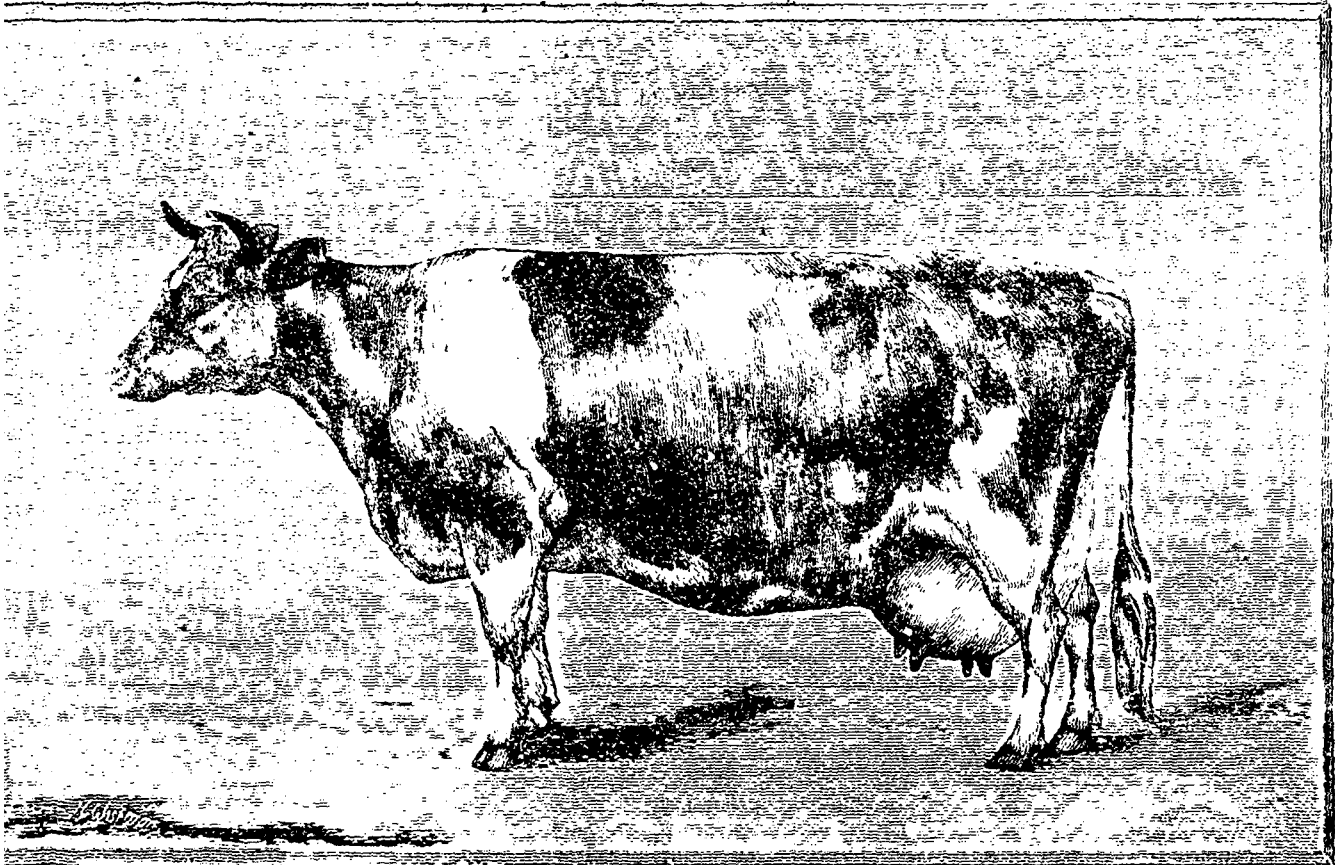
The results of the experiments seem to warrant the following conclusions :

1. That three-fourths of the cherries, plums, and pears liable to injury by the curculio, may be saved by spraying with London purple.
2. That if an interval of a month occurs between the last spraying and the ripening of the fruit, no danger to health will follow from eating the fruit.

ket! "A true and faithful analysis" of each "brand or quality," which the law requires shall include the guaranteed analysis of the article, and must be uniform on all packages, is to be lodged with the Commission; so that, in point of fact, the paternal State has done, once for all, for its agriculturists, what otherwise each individual would have had to get done by an analytical chemist at his own expense.

The following label is to be affixed to each bag containing fertilisers :

Weight of bag
 Name or brand.....
 Trade-mark
 Manufacturer's address.....
 Analysisdate.....



GUERNSEY COW FLOWER 2ND.

As for the lime spray, as the fruit seems to have been coated with a thickish layer of white-wash, I should not care to practise it.

Annual report (10th) of the N. Carolina Station.—Immense pains seem to be taken at every station in the Union to secure purity of composition and cheapness in the various fertilisers offered for sale. The manufacturers are kept, as far as possible, under severe control, and, to begin with, have to pay a license fee of \$500, and to file their trade-mark with the Commissioner of Agriculture. The license is required upon every separate "brand or quality." Thus, if the same rule obtained here, Messrs. Brodie and Harvey, who advertise five "brands or qualities" of manure, would have to pay a license fee of \$2,500 before they could put their goods on the mar-

Available phosphoric acid..... per cent.
 Nitrogen (or ammonia if claimed)..... " "
 Potash (if claimed).. " "
 North Carolina privilege-tax paid.....

By "available phosphoric acid" is meant the sum of the soluble and the so-called "reverted."

As a further check upon the trade, gratuitous analyses are made at the station for any actual N. Carolina farmer who will send samples taken according to certain directions issued by the government of the State.

The results of the experiments carried on at this station on the forage-plants, on permanent pasture, &c., though interesting in themselves, would be of little value to us on account of the vast difference of climate. Fancy the temperature of January varying from 73° F. to—4° F. = 77 degrees!

Consuming value.—When a tenant is leaving a farm in England, the hay, straw, &c., is taken by his successor at what is called "consuming value." It has been always a moot point with valuers—or *valuators*, as they are called here and in Scotland—what this consuming value really is. The truth is, that the point is a variable one, depending upon the situation of the farm, its nearness to markets, &c. The English Agricultural Gazette puts the consuming value of straw at one-third of its market-value, and that of hay at about one-half. In the case of mangels, swedes, and other roots, the consuming value would bear about the same ratio to the market-price as hay does, so if mangels are worth 20s. a ton, as they usually are, to sell, they would be worth 10s. a ton to feed, and that is the usual allowance made for them.

The average yield of fall-wheat in the States has been, according to the report of the U. S. Department of Agriculture, 12 bushels an acre, that of spring-wheat slightly over 10 bushels. The total wheat-crop of the States amounts, probably, to some 410,000,000 bushels, and as the natural weight of the grain is about 7 per cent. less than the 60 lbs. per bushel at which it is sold, there is that deduction to be made on the total yield, making the real production of wheat in the States, for the year 1888, 407,130,000 bushels: this reduced to English quarters would amount to all but 51,000,000 quarters.

I cannot find out the number of acres in wheat during the past year in the States, but, allowing for a fair increase in the number of acres sown, let us say there will be 38,000,000 acres demanding seed for the harvest of 1889; this would amount, at 2 bushels an acre, to 9,500,000 quarters. Again, supposing a population of 60,000,000, each of whom require 5 bushels of wheat for food, we have a consumption—deducted of 37,500,000 quarters, which two amounts being deducted from the total yield, will only leave 3,500,000 quarters for exportation.

American vs. English cattle.—Mr. J. H. Reed, of Nebraska, in a letter to an English paper, after observing that many if not most of the different States of the Union could make as good a display as he saw at the late Islington Dairy-show, except in Guernseys and in Welsh cows, goes on to say that "after seeing the uniform excellence of the herds on your farms, I am thoroughly impressed with the fact of our being very far behind you in the general average of good stock. The matter is being now discussed among us of discouraging further importations of breeding stock and encouraging our home breeders, who are now able to display as good individual as any imported, and I confess to be one who has held this opinion. But I shall go back with it very much changed. Having seen the great uniformity of excellent quality in many parts of Ireland and Scotland, as well as in England, I am thoroughly persuaded that there is something back of the good individual animal that we want. The long-continued breeding in one direction in your more circumscribed area of country has given a fixed character to your stock which we have not yet secured, and I am satisfied it will be safer for us to use all the blood we can get from your herds yet for a long time, and I shall go back prepared to teach that doctrine." Time, and time alone will get rid of what the Americans call "scrub" cattle. I do not suppose that the dairy-farmers in the States will breed thoroughbred stock at any time, for I think we may take it as proved that the cross-bred cow is, as a general thing, more profitable, at least our dairy-shows are generally, if not invariably, headed by the high-grade shorthorn. See the next paragraphs.

The Milking trials at Islington.—The breeders of pedi-

gred shorthorns seem to have given up all idea of competing for prizes at the great dairy shows in England, and therein have shown their wisdom. For many years they have dried off their cows as soon as possible after conception, with a view to enable them to devote all their powers to the sustentation of the embryo, and, in consequence the cows have, so to speak, got out of the habit of giving milk. At the late dairy-show, held at Islington, the pedigreed shorthorns are said to have been as moderate a lot as ever were got together, and were only five in number!

But a very different tale is told of my favourite breed—the true dairy-shorthorns. They hold their usual place at the head of the milch cows of all kinds. The competition for the Champion prize seems to have been very close, the total marks of the first and second awards, both to shorthorns, being 136 and 135.9—almost a dead heat. The following extract from the notes of the Judges show that the shorthorn cows had it all their own way: the 1st and 2nd shorthorns'

Class	PURE-BRED SHORTHORN		SHORTHORN COWS. (high grades.)		JERSEY COWS.		GUERNSEY COWS.		CROSS-BRED SHORTHORN AND HOLSTEIN.	
	Morn.	Evn.	Morn.	Evn.	Morn.	Evn.	Morn.	Evn.	Morn.	Evn.
Number	3	10	21	48	56	76	82	107		
Average weight of milk:—	11.3	9.5	13.0	15.0	19.0	22.2	18.6	18.2	28.0	25.7
Composition of milk:—										
Solids	12.48	12.64	13.12	16.46	16.94	13.2	14.04	13.90	14.60	16.54
Fat	3.66	3.63	4.34	4.81	6.66	6.27	4.07	4.83	4.67	6.96
Other solids	8.82	8.99	8.78	9.43	9.80	9.67	9.13	9.21	9.23	9.58
Actual weight of fat in lb	.41	.34	.99	1.33	1.06	1.44	.99	1.76	.89	1.17
Actual weight of other solids	.99	.85	3.33	2.73	2.68	2.82	1.47	1.41	1.73	2.04
Points—For time since calving	12.3		.2	18.0	3.7	5.5	7.9	
For weight of milk	20.8		65.1	29.6	37.7	40.8	36.0	53.7	28.0	
For weight of fat	16.1		46.4	38.2	33.1	40.5	40.3	39.0	28.0	
For weight of other solids	7.4		24.3	11.5	13.8	15.0	13.7	19.7	28.0	
Total	55.6	136	135.9	97.3	88.3	101.8	89.0	126.3		
Awards		2nd Prize.	2nd Prize.	1st Prize.	2nd Prize.	1st Prize.	2nd Prize.	2nd Prize.		Silver medal.

marks exceeded those of the 1st Jersey by 10 per cent., and beat the 2nd Jersey by 50 per cent. The two Shorthorns gave of pure butter fat at the rate of 16.17 lbs. and 17.50 lbs. a week; the two Jerseys gave 13.30 lbs. and 11.55 lbs.

Guernseys beat the Jerseys, the marks standing for 1st and 2nd prizes, thus:

Guernsey cows 1st prize... 101.8 Jersey cows 1st prize... 97.3
 " " 2nd " ... 89.0 " " 2nd " ... 88.3

The marks of the Shorthorn heifers—91—85, were very little fewer than the marks of the Jersey cows—97.3—88.3, while the early maturity of the Jersey heifers was well displayed, they having obtained 91 8, and 80 marks—almost as many as their older sisters! Only one Guernsey heifer was entered for trial, and she only obtained 69 marks.

Cheese at Islington Here's a nice state of things! The Lord Mayor's prize for the best twenty cheeses went to Scotland! And why? "Because" says the *Agricultural Gazette*, "dairy instructors from CANADA have been at work in the neighbourhood of Stranraer, Wigtownshire, and we cannot doubt that the success of Mr. Drumflower, of that county, has been largely due to that fact." So, as I remarked last month, the dairyman really makes the cheese and not the pasture. What will Archbishop Denison say to this? Of course, the cheeses were *Cheddars*, though made 400 miles from that Somersetshire village.

Wheat-prices—The inferiority of the quality of the new wheat-crop as compared with that of last year (1887) may be judged of from the fact that on the 13th of October, at Reading, England, the price of old wheat was 24 cents a bushel higher than that of new wheat: 42s. a quarter new, 50s. a quarter, old wheat.

Fertilisers—My correspondents, the Messrs. Downes, of Liverpool, send me word that the price of fertilisers is likely to be much higher this season than last. Superphosphate is already up a dollar a ton. This is owing to an important rise in freights and a serious increase in the cost of the raw material, equal to from 15 to 20 per cent. Canadian apatite on 80% base, being apparently worth nearly \$20 a gross ton in Liverpool. Nitrate of soda and sulphate of ammonia are both \$2.50 a ton dearer.

Ploughs—A new plough has been brought out in England by the well-known firm of Ransome and Sims, of Ipswich, which seems likely to throw all other patterns into the shade. A most interesting series of experiments was tried with it in Gloucestershire last month, which were witnessed by nearly fifty of the landlords and tenant farmers of the country. A friend sends me the following description of the trials, which occupied about seven hours, in two fields, one of which was a clover-ley and the other a stubble. The ploughs were tested at various depths, but the bulk of the land was ploughed six inches deep by twelve wide, which was easy work for a pair of horses. As a great deal of the land in the district is ploughed in seven-foot ridges, the new plough was tested with one wheel instead of two, and was found admirably suited to that style of work. That there might be no mistake as to the draught of this new "Digger" as compared with the ordinary make, it was carefully tested with the dynamometer, and, for the purposes of comparison, one of Ransome's ordinary ploughs—the Newcastle prize plough, R. N. E.—was put to work. This latter implement, ploughing six inches deep and nine wide, registered a draught of five cwt., whilst the new digging plough, ploughing six inches deep and twelve inches wide, the share cutting the full width of the furrow, only re-

gistered a draught of four cwt. This test was most carefully carried out, and the records of the dynamometer were taken by independent farmers. The new plough was then shown as a pairing or skim-plough, for which work it is most admirably suited, and could easily be worked with one horse.

The chief advantage of the new implement is, that instead of turning over a solid furrow it is broken and thoroughly pulverised by the particular shape of the breast and the tail piece attached to it. The latter catches the furrow as it is turning over and thoroughly breaks it up, so that the work resembles spade cultivation as near as it is possible. At least three quarters less harrowing is necessary, and on a light alluvial soil the drill might follow the plough. It is also capable of burying any quantity of long manure or surface vegetation, the furrow being completely turned upside down, causing all air to be excluded, and thus preventing the growth of weeds, &c. No coulter is required, its work being done by the skim-share. This effects a great saving in blacksmith's work. The lightness of draught is mainly accounted for by the fact that the beam is nearly 18 inches shorter than in the ordinary plough, thus bring the horses nearer to their work and the wheels closer to the body. The land side of the plough is overcut, or, in other words, it cuts the land on the angle, instead of perpendicularly. This is an important feature. The breasts and wearing parts of the plough are all made of chilled metal, which is considerably harder than steel. On cutting land, this will effect an immense economy, as it is computed that one of these chilled breasts, though considerably cheaper, will wear as long as half-a-dozen made of steel.

The meeting seems to have been unanimously in favour of the new implement, as a great saver of time and labour, and no less than 140 ploughs of the above pattern were sold in the neighbourhood by one agent immediately after the trials.

Singling root-crops.—I have no doubt but that at the next meeting of the Dairymen's Association, which will take place at the Agricultural College at Assumption on the 9th and 10th of January, 1889, the process of singling root-crops will be thoroughly investigated. I allow four women a day for the singling of an acre of roots at 10 to 12 inches apart, but I see by the Report of the Farming of East Lothian, in the 2nd part of the 14th volume of the Journal of Royal Agricultural Society of England, that in the county referred to, "The swede variety is usually ready for singling in about six weeks after sowing. They are either singled by hand or more generally, by the hoe—3 persons overtaking an acre"—nearly one-sixth more than an arpent—"in the day, in ordinarily favourable circumstances."

Sheep on turnips.—They do not grow finer crops of roots in New Zealand than we can here, neither are wages lower there than those we are accustomed to pay. Of course, their winter is a very different sort of thing to ours, as the ground is never so hard too allow the fold-stakes to be driven in to it. But, I must say I should like to see a partial following out of one part of their practice in this country; as for instance:

"Large numbers of sheep are being shipped to England by the farmers of the North Island. The writer has about 14,000 on turnips, and a neighbour has 36,000, of which 16,000 are fat wethers, also on turnips—a nice little fold, truly!" In consequence, the writer has been able to sell three of his farms for \$50, \$75, and \$80 an acre, whereas, for the previous seven years, he had not been able to dispose of any land at all. In this country of ours, rape I have always held to be preferable to turnips for folding sheep, as it stands frost far better, and an acre of it will go as far as $\frac{2}{3}$ of an acre of turnips, and not cost above half as much to grow. Make mutton, somehow or other, we must, unless we want to

see ourselves behind other countries. Nets, for folding, can be sold at a profit in England at the rate of 200 yards for £4 = \$20 in round numbers, and they ought to be quite as cheap if made here. If kept dry under cover in an airy place when not in use, nets will last a long time. Still, in this country, where wood is so easily had, I should use the *rolling hurdle*, an engraving of which has been published two or three times in this periodical.

Elephant swedes.—A huge heap of this novelty was exhibited by Messrs. Carter & Co. at the late Dairy Show at Islington. It is quite distinct in colour and shape from all other varieties, and when seen in growth as a field-crop by the side of other swedes, it is as a giant among dwarfs. I should like, however, to see of what sort of quality the flesh is before sowing largely of it.

Harrowing fall wheat in spring.—A writer in the *Country Gentleman* is good enough to speak of "the absurd practice of harrowing fall-wheat in spring." This gentleman is probably not aware that the universal practice in England is to harrow all the fall-wheat as soon as the weather will permit, to hand- or horse hoe it after wards, and to roll it down with a heavy roller, weighing from 2,000 lbs. to 3,500 lbs., and sometimes even more. May it not be owing to this perfect cultivation that the average crop of England is about 140 per cent. more than the average crop of the States? The first thing that strikes the newly arrived settler on this continent is the general neglect of what we call, emphatically, cultivation. There are, one may say, no fallows, and, in fact, hardly any preparatory crops of any kind. In a tour of more than 400 miles last summer, I saw but a patch or two of root-crops, and that in a part of the province too cold for corn. The few pieces of swedes I saw were most luxuriant in growth, and although very badly treated as to cultivation, gave promise of a large product. Two, or at most three, harrowings are all the work expended on our grain crops, and cross-ploughing is a process almost unknown in the province, the major part of the heavy land in the French country never having received a cross-farrow or a cross-grubbing since it was broken up out of the bush, the narrow lands or ridges having merely been turned backwards and forwards, year after year, since the land was first brought under the plough. This is not cultivation; and on farms treated in this way no rise of price will enable the farmer to make a decent profit out of his grain.



INCISION ON THE RIGHT FLANK.

Hounds.—It may astonish some of my readers to learn that in England there are 156 packs of foxhounds; 13 packs of staghounds, 97 packs of harriers; and 19 packs of beagles, which latter are for hare hunting, but are generally *followed on foot*, not on horseback. In Scotland, there are 7 packs of foxhounds and 6 of harriers; in Ireland 2 packs of staghounds, 17 of foxhounds, and 24 of harriers; bringing up the total to 341 packs, none of which hunt less frequently than twice a week; many five times, and a few six days a week.

Linseed and molasses.—Mr. Vernon, of Waterville, whose letter will be found at page of this number of the Journal, is well known as one of the most successful breeder of Herefords on this continent. Mr. Vernon asks a question which I am very glad to be able to answer in the affirmative. It is high time to give up using linseed-cake at the present price, and turn to the raw material itself. *Letter crowded out.*

The argument of the backers of the New Process linseed cake is that as the albuminoids, or flesh-formers, are the most costly constituents of all cattle-foods, and as the oil of the Old Process cake can be supplemented by the carbo-hydrates of corn- and other meals, the N. P. cake is the more remunerative purchase to the farmer. This is the opinion of the pure theorist but the practical man who, like Mr. Vernon, has had experience of the value of linseed-oil from the reply his animals invariably make when interrogated on the subject, will shut his ears to the charming of the theorist, whom he never so wisely,

and will adhere to his own views the more firmly since they are supported by the practice of so thoroughly skilled a feeder as Sir John Lawes.

I have written to Sorel about the quantity of linseed available in that market, but I fear the crushers have been before me. Next year an application soon after harvest will stand a better chance of success. (1)

At the risk of repeating myself, I will relate an occurrence that happened in Essex, England, in the year 1852: I was then fattening 37 shorthorn bullocks; each beast receiving daily 6 lbs. of pease-meal, 2 lbs. of crushed linseed, a bushel of swedes, and a bushel of oat-straw chaffed. My neighbours, Sam. Jonas, of Icketon, who turned out an average of 240 fat beasts a year, John Clayden of Saffron Walden, Thomas Webb, and other large farmers, having inspected my yards several times during the winter, told my cattleman that it was all nonsense pretending that the feed above mentioned

(1) It was all sold before my letter got to Sorel. A. R. J. F.

was all the beasts got, for they gave their bullocks 100 lbs. of swedes, 15 lbs. of cake 5 cake of English make, then 3 lbs. each, and lots of hay, and mine fattened faster than theirs. (1)

I have no knowledge of the practical effects of molasses on fattening beasts, but as the negroes on the Jamaica estates used to get very fat during the cane-crushing time, I conclude molasses would make fat beasts, though the beef would not be marbled. Pease, horse-beans, or Egyptian lentils, with linsced crushed and mixed with plenty of boiling water and straw-chaff, and a bushel of swedes, Belgian carrots, or man gels, will make the firmest and best flavoured beef or mutton in the world.

I hear nothing about a Montreal Exhibition except from the Messrs. Dawes, who seem very anxious to have one.

Devonshire butter.—The English Agricultural Gazette says, speaking of butter from *clotted* cream. "All those who know this system know the objections to it, and that the butter, by containing a large quantity of curd, weighs more than it should."

Now, I differ entirely from this statement. The butter made after the Devonshire fashion comes in the granular form, and if it is washed in that state, as it should be, under a gentle stream of cold water, the curd may be seen floating on the top of the skin milk and running off with the overflowing water. If there were more than the inevitable quantity of curd in Devonshire butter, would it keep, as it does, far better than butter made in the ordinary way?



INCISION ON THE RIGHT FLANK

OUR ENGRAVINGS.

Da' y-Shorthorn, Christine.—This magnificent cow, the property of the Queen, won the first prize for unpedigreed shorthorns, at the late milking competition at Islington: v. p. 6.

Guernsey cow, Flower 2nd.—A milk-cow all over.

Spaying operations.—v. pp. 8, 9.

ARTHUR R JENNER FUST.

GUERNSEY CATTLE.

No definite conclusion can be arrived at as to the origin of the Guernsey breed, some maintain that it is descended from animals introduced by the Scandinavians, others that it came from the neighbouring coasts of Normandy. It is, however, very clear that in 1819 laws were passed in Guernsey prohibiting the importation of cattle, and thus it is known that no admixture with foreign blood has taken place since that date, and consequently that the cattle are, in truth as well as in

name, pure-bred. It is generally acknowledged that the strains on the island were substantially the same for many years after the prohibition of importation from Jersey to Guernsey, and that the great difference which now exists between the two breeds has resulted from selection and breeding with different aims in view.

In "Low's Domestic Animals," published in 1841, is a chapter devoted to the Alderney cow. A well executed illustration is of especial value in establishing her characteristic traits forty five years ago. It presents a cow of orange-fawn and white colour, having darker shade on the head and neck, with dark nose and a circle of reddish tint around it. The end of her tail is white, and her low, handsome horns are tipped with black. A half-grown calf lies by her side, and the colour of this is a pale orange fawn, with much white. On the forehead is a large white triangle, and the nose is a perfect buff. The animals would at once be recognized as Guernseys but it is stated at foot that they were the property of Mr. Brehaut, of Jersey, and the article describing the cattle of the

Islands says the breeds are essentially the same, although "the Guernsey deviates from the common type, and presents a greater affinity with the races of Normandy, the individuals having more spreading horns, the size being larger, the form rounder, the bones less prominent than in cattle of the other Islands." As to quality, it defines them as "having a thin skin of rich orange yellow, and the fat as well as the milk and butter is tinged with the same colour."

It mentions their importation into this country in considerable numbers "where they are esteemed beyond any others for the richness of their milk and the deep yellow tinge of the butter."

It will be recognised that the above are still the characteristics of the Guernsey cow of to-day. It is, therefore, evident that a very much greater change has taken place in the case of the Jersey than in that of the Guernsey.

This is, no doubt, partly owing to the Jersey being the larger and principal island, and also to the fact that the Jersey men have taken advantage of their opportunity, and bred with far greater skill and perseverance than their Guernsey brethren. A large demand sprang up for the Jersey, and the breeder gave the fancier a pet lawn cow, one which, in form and colour, should show well on the green sward of English parks. He bred, as the fashion of the time required, from fawn-and-cream to silver grey, with solid black points and whole colour, and so well that he has made the Jersey almost a new breed, a beautiful one, and one that will never lack warm friends and admirers. The Guernsey breeder, on the other hand, was always more conservative, and it is, perhaps, on the whole, fortunate that he was so.

He has not been so much in touch with the outer world as

(1) My beasts had the streaw of their bedding to eat as well as the rations mentioned. A. R. J. F.

his more energetic neighbour, and hence his sole aim in breeding has been to obtain animals for his dairy. His surplus stock have not realised the high prices of the Jerseys, and have thus gone into the hands of practical dairy farmers, as may be seen by the cattle in Hampshire and the adjoining counties, radiating from Southampton as a centre, being largely characteristic of Guernseys.

The Guernsey man's faith in a cow having a golden skin, with gilding in her ears, on and around her horns, and at the end of her tail, was too firm to be shaken, and he has handed down to us a dairy farmer's cow of quiet and gentle disposition, and yielding large quantities of rich milk and butter. The establishment of the English Guernsey Cattle Society marked an important epoch in the history of the breed, and great results have been attained. The careful registration of the purity of all animals has given a great impetus to the breed, and especially increased its value as a long-descended race with fixed dairy characteristics, making the breed of especial value for crossing on the ordinary stock of the country.

G. TITUS BARHAM.

AGRICULTURE.

Paris, September 29.

According to an Arab tradition, wheat was brought to man by the archangel Michael; the size of the celestial grain was then equal to that of an ostrich's egg; but as man advanced in wickedness, the volume of the grain proportionately diminished, till at the epoch when Joseph was sold by his brethren, the size of the grain of wheat had diminished to the volume of a pea. The agriculturists of France do not aspire to augment the size of the grain of wheat, but to increase the number of grains per acre. On the subject of grain raising, continental, but above all French, farmers are in a positive flutter. Their sheet anchor they maintain, lies in the raising of wheat, and to do this effectively, soils must be cultivated on scientific principles: that is, have land in good tilth, from ploughings: in good heart, from supplemental fertilizers: secure vigorous plants, by careful selection of sound seed, and allow the plants to stool, by sowing in drills.

The majority of the agricultural opinion in France, independent of political thinking, for the latter disappears before the interests of the pocket, is in favor of keeping out Indian, Australian, and American cereals, at present surtaxed to the extent of 50 fr. per ton. Bread is rapidly rising in price, and by the close of the year, the expediency of suspending that duty may have to be summarily decided. Without examining the question, if the world's grain harvest this year be sufficient for the world's food, French people have to face the stern fact, that the yield in their wheat harvest is a good one-fourth inferior to what is required for the ordinary wants of the nation, and that about 700 millions fr. must be expended in hard cash to purchase the deficiency. Russia has not much spare grain to export, her winter raised grain comes from Poland, around Kiev, and the Baltic sea-board; spring grown corn, is peculiar to the southern provinces. It is well to note that the mean average price, per cwt. in France, of wheat, is in francs, $12\frac{1}{2}$; of barley, $7\frac{3}{4}$; of rye, $7\frac{1}{2}$, and of oats $8\frac{1}{2}$.

The average yield of wheat per acre in France is 37 bushels—the bushel of wheat varies in weight, from 60 to 62 lbs. The annual wheat crop in France, is 305 million bushels; she requires for actual necessities, 330 million bushels, of which 40 millions are for seeding. This year, her harvest has only returned 234 million bushels, or 96 millions less than the total positively required. The best year France saw for

wheat, was 1874, then the total yield was 400 million bushels, or 70 millions in excess of her total wants, and that she exported. The aim of her agricultural doctors then is, to arrive at the raising of 480 million of bushels annually, which, after comfortably catering for her own necessities, would leave some 130 million bushels to supply the permanent yearly wants of England—some 96 million bushels—and so out America, Australia and India out of that market.

To reach this ideal, French farmers would have only to augment the yield of wheat per acre, from 17 to 28 bushels. Now bad as the expired season has been, well managed soils have, in different regions of France, produced 28 bushels per acre; and in a good meteorological year, as high as 44 bushels. An extra bushel of grain implies an extra 7 fr. By an expenditure of 50 fr. per acre on dephosphorized and powdered clinkers, and nitrates, 35 bushels per acre, other conditions being equal, are obtained without difficulty. The import duties on breadstuffs bring into the French treasury per annum 150 fr. millions. It is suggested that the government allocate one-third of this sum to aid farmers to purchase fertilizers. If the large proprietors fail to set the small holders the example of intelligent processes of culture, and of economical personal expenditure, there is nothing left for "Young France" but that they emigrate bodily to some new country. There is still another cure before matters come to this strait, and which is being seriously discussed, that of financial societies purchasing lands at low prices which cannot be profitably cultivated, and converting them into commercial farms, with all the scientific and mechanic processes of modern agriculture applied to their exploitation. France has clearly staked the existence of her agriculture on wheat farming, though a wise person never puts all his eggs in one basket; if beaten out of the market by America, Canada, Australia, India, and the Argentine Republic, she will have to through up the sponge. Old Europe must "advance", as do her young rivals.

The potato disease has this season appeared with marked severity. Like the poor, it is always with us. Perhaps there are as many cures for the malady, as for the phylloxera. There must certainly be excepted from the multitude of perfect cures, the remedy recommended and made known by Mr. Prillieux, the head inspector of agricultural education. As early as 1886, he drew the attention of the Central Society of Agriculture to the efficacy of a solution, employed by the Bordeaux Vineyard proprietors, to destroy the mildew which devastated their vines. The mildew was produced by a mushroom—the *peronospora infestans*. Now it is exactly the same parasite which attacks the potato plant; and as in law, like case, like rule, so in physiology, like disease, like cure. On the first appearance of a spot on the leaves, sprinkle the latter with the following solution, commonly known as "Bordeaux Broth": 6 parts of lime, and 6 of blue vitriol, dissolved in 100 parts of water. It has been tried this season on early potatoes; two plots were marked off in the first days of August, in a field where the spots showed; one plot received the broth, the other none. When the potatoes were raised, not a single diseased tuber existed in the plot that had been treated with the preservative liquid, while in the other, 32 per cent of the tubers were unsound. It must not be forgotten, the official position of the gentleman who attests the experiment. And why not? The same mushroom attacks the vine, and the latter is saved: the same mushroom attacks tomatoes, and is similarly got rid of. Indeed were it not for the "broth" the tomato crop in the south of France would ever be a failure.

While on the subject of potatoes, a discussion is taking place relative to the connection between the flowering of the plant and the development of the tubers. In our temperate climates, the flowering of the potato plant is limited: the ma-

majority of the varieties do not flower: a very few do, and duly bear fruit, or apples. It is not so in Chili, that may be considered the native home of the potato: there, the plant flowers and ripens its apples, but the tubers are very small. In temperate zones then, the formation of the tubercles is favored at the expense of the flowering. It would appear then, that from the reproduction point of view, the energy of the seed involves the decadence of the tuber, and vice versa. Langenthal and Knight have shown, that the flowering can be augmented, by removing the young tubers, as they appear. Per contra, suppressing the flowers, augmented the development of the tubers. Without being conclusive, the results tend in the direction stated. It is clear, that in our zones, the potato displays characteristics unknown to the plant in Chili. Is the difference due to the latter's drier and brighter climate? possibly these two causes favor flowering, while a more humid atmosphere, and a more clouded sky, tell more favorably on the tubers. The great influence of the light on the production of flowers is well known. Sachs has shown, that they are the chemical rays of light which induce flowering — a fact new and unexplainable. Doubtless also, part of the cause may be attributed to the varieties of the plant, which incline to tubers, less than to—or not at all, flowers. There are many plants that reproduce themselves artificially or naturally, by cuttings, offshoots, tubers, &c., and while flowering all the same, do not produce fruits; or if producing the latter, remain sterile, because their seeds do not form. While the direct influence of climate and of *milieu* cannot be questioned, the tendency to favor the production of tubers, may have done more, by imparting an hereditary tendency in that direction.

German farmers are very partial to compressed bran or cake. In that form, bran occupies three-fourths less space, hence, an advantage for storage and transport. It is dearer when compressed than when loose, and it keeps better, a smaller surface being exposed to the air, for meals rapidly absorb humidity and deteriorate. In point of digestibility, there is no marked difference.

The present year has been very extraordinary; the hay crop has been lost; the grain harvest has been deficient, but while grain will be forth coming somehow, the same cannot be said for straw, either to supplement fodder, or to act as litter. Deficiency of the latter implies a diminution of farm yard manure. The substitutes for litter are not a few, only they are within reach of the few. Germany exports dried turf powder for cow sheds and stables; but it is dear, and unless near a marshy district farmers cannot otherwise obtain turf. Tan is not to be met with everywhere, and indeed is but good for littering on condition that it be daily covered with a few handfuls of straw, or dried weeds, or leaves. Like tan, sawdust cannot be obtained everywhere, and it requires to be kept several weeks under the cattle perhaps, and to be daily coated with a little straw or leaves. In despair, many farmers are carting under sheds soil from their fields to dry, and to serve as bedding.

The Farmers' competition at Brussels was very satisfactory; there were 180 entries; a test examination reduced the competitors to 40, and these had to forge a shoe and put it on the horse, as ordinarily, in the space of fifteen minutes; some did the set task in fourteen minutes. There were four first prizes of 100 fr. each. It was trying on the judges to have to look out the trials.

Russia have more lady doctors than any other nation: soon she will have more lady professors of agriculture, and more lady directors of example farms. In the north of Russia, example dairies and breeding farms, are very numerous, and are superintended by women, and also worked by their own resources. They send young ladies to Germany, France, Hol-

land, Denmark and Belgium, to study special features in farming. Mme Grinew, has converted her estate at Sassulinzy into a practical school for teaching peasant girls kitchen gardening, the rearing of bees, poultry, the care of stock, the management of a dairy, cooking and household management. Each pupil must be 15 years of age, and to fully understand what she has come to learn. Eight months is the period of residence, and the school aims, not to train exactly the girls, but to fill their heads with practical notions, and develop self-reliance, and the thinking faculties. The teaching system is original: there are no classes, no lectures, no professors. At the fire in the evening, the girls sit around the directress: she asks each pupil to relate what work she was engaged on during the day; what she experienced to be difficult, and what she did not comprehend. Explanations are lucidly given, and questionings encouraged, with references to standard works bearing on the subject in hand. The girls are thus encouraged to love knowledge in seeking it themselves. This is the ancient Greek system, the peripatetic: only mistress and pupils sit, instead of walking about. Then the pupils examine one another, the directress cutting in as required. Women who are pining to have work and embarrassed how to employ their surplus wealth, have here a wide "field" and a noble cause.

If cows be milked three times a day, it is advantageous to allow eight hours to elapse between each milking; if twice a day, twelve hours. The cows ought to be milked at a moment when they will be exempt from all that can irritate or disturb them, for, presuming the cow to be in health, she likes naturally to be milked and enjoys the operation. In the morning, the best time for milking is when the shed has been cleaned and ventilated after the night, the udders sponged and wiped with a coarse-cloth, as in Holland, and the animals partaking of their first feed.

The practice is spreading to give, during hot weather, to draught horses and oxen, some vinegar in their drink. The animals relish it, and it keeps them in robust health. The soldiers of ancient Rome and of Carthage, received a certain quantity of vinegar daily with their rations: the Russian soldiers are similarly treated. (And the English Navy sailors too. A. R. J. F.)

Since 1862, France has brought under irrigation two and a half million acres of grass land, by means of canal and other engineering works, and by so doing, has doubled and in some cases tripled, the yield of hay per acre. About 34 per cent. of the arable land in Holland is under grass; in France, that percentage is 11½, and in Germany 12. In France, the yield of tobacco is 40 cwts per acre, and in Belgium, 17 cwts.

The streets, or "toilette" of Paris, are scavenged between 3 and 5 o'clock every morning; in the leading thoroughfares two additional general sweepings are given. A society has been formed to gather up the horse droppings in the streets: a man with a shovel, a broom and a special waggonet, promenades the streets, and gathers the manure; 60,000 horses traverse the streets per day, and the society gathers 14 tons of stuff daily.

Mr. Lourret, of Marseilles, says, when purchasing a horse, have it tried on hard ground; if possible trotted out on a paved road.

Mr. Gayon, of Bordeaux, analysed 378 samples of pure claret, and found their mean alcoholic strength to be 11° 44 degrees.

Southdown Ram, Standard.

In the list of sheep which have won for their race the enviable reputation which the Southdowns have established in the New World, is "Standard" 286, whose picture appears above.

Standard is nine years old. He was bred by Sir N. W. Throckmorton, of Farningdon, Eng. Representatives of the flock of Sir Throckmorton, H. R. H. The Prince of Wales and Mr. Edwin Ellis won all the first prizes at the Bath and West of England Society's Shows in 1887.

He is the property of Col. C. P. Mills, secretary of the Illinois State Board of Agriculture, Springfield, Ill. Since 1879 Standard has made a record as a prize winner not excelled if equaled in the United States. In 1879 he won first prize at Fort Wayne, and at St. Louis, Mo., and first and sweepstakes at the Illinois State Fair.

As a two-year-old, in 1880, he took first at Jacksonville, Ill.; second at LaFayette, Ind.; second at Lawrence, Kan.; first and sweepstakes, and first as ram with three lambs; and first at St. Louis, Mo., and at Jerseyville, Ill. In 1881 he won first at Jacksonville, Ill., and at Minneapolis as ram and ten ewes; second at Chicago in 1881, second and first as ram with five lambs at Illinois State Fair, and second at St. Louis. In 1882 first as ram with nine ewes at Jacksonville, Ill. second at LaFayette, Ind., as ram with four ewes. At Crawfordsville, Ind., second; Wenona, Ill., first; and at Illinois State Fair, second, and first as ram with five of his get, and at St. Louis, Mo., second.

The Downs are more than holding their own against all varieties upon their native heath, and still retain the reputation among old flock masters as the sheep able to live where other breeds will starve, and in America they stand high among consumers who appreciate choice wool, and plump neat, and handy carcasses. (1)

The Short-Horn bull Mario 51713, whose portrait appeared last month, has taken many honors in Scotland, and this year gained first prizes at the Norfolk and Essex county shows, and the first and champion prize as best bull at the Royal Show at Nottingham. Mario is described in the London Live-Stock Journal (from which the picture is re-engraved for us) as a roan, - got by Field Marshal 47870 out of Mina 3d by Border Chief 37874, bred by Mr. Duthie, Collynie, Tarves, shown by A. M. Gordon, Newton, Aberdeenshire, and afterwards sold to C. W. Brierley, Rosedale, Tenbury.

Twenty years' experience with ashes and bone.

T. H. HOSKINS, M. D.

Character of the land; enriching the first crops; heavy manuring; experiments with fertilizers; present condition of the farm.

The Rural asks my experience with ashes as affecting the mechanical condition of the soil, quoting Prof. Storer's remarks that the effect of some potash manures is to make a sandy soil more compact. My soil would rank as "light," yet it is not what could be described as sandy. The farm is part of a plain upon the east shore of the Lake Memphremagog, spreading out a mile or more from the hills, and from 40 to 60 feet above the water. As the old beaches along the hillsides show, it was once a hundred feet or more under water. It is in fact an alluvial plain, and boring strikes on rock. We find water only in a quicksand, which is reached at about the lake. It is precisely such land as the city of Louisville, Ky., stands on, which is a plain extending several miles back to hills, in the same way, and which was also once under water, before the limestone reef which makes the Falls of the Ohio, was worn down enough to drain it. There is a considerable variety in such a deposit, some spots being quite sandy others gravelly, and there being occasionally a streak of sandy clay, or a little "hardpan," i. e., gravel cemented by

(1) Crowded out last month.

oxid of iron. Generally it is fine garden land, but mine, which originally bore a heavy growth of Sugar Maple, had been "potatoed to death" in the 20 years it had been cultivated, so that it was considered entirely worn out. But I had seen just such old fields, in the rear of Louisville, brought up by German gardeners in a few years to high productiveness. This was done by stable manure from the city. I could not get much manure, but I could get ashes, and the first thing I did was to turn over the "bound-out" sod, sow on the furrows 60 bushels of ashes to the acre, and with an ammoniated superphosphate in the hill plant nearly all of it to corn. The crop was remarkably good, and a small piece of potatoes bore also a good crop. I kept a couple of cows and a horse, and bought what manure I could pick up in a little village of 300 people. I bought ground raw bone liberally, and composted it with ashes, wetting the mixture, and letting it stand some time before using. I may say that I never had a poor crop of anything, and the fifth year I had an acre of Brezre's Prolific Potatoes that gave me 460 bushels. On the same piece, where I had dug off an early crop of Early Rose, I got nearly, at the rate of 1,000 bushels of flat English turnips per acre. I have kept on this way, growing anything I could find a market for—nursery stock, strawberries and other small fruits, seeds, etc., etc., gradually working most of the place into an apple orchard. There is no question but that the soil has grown more compact with this treatment, approaching more nearly to clay in its nature, so that now, though not at first, attention must be paid to its condition as regards moisture before plowing, otherwise it will be somewhat lumpy. In the 20 years I have put on not less (upon 12 acres) than 3,000 bushels of ashes, 40 tons of bone, in various forms, and all the manure I could make or buy, which perhaps would amount to an average of 20 cords a year. I have also used about half a ton yearly of a good commercial fertilizer, at first in the hill, but later broadcasted on such crops as I want to push early. I have also experimented moderately with sulphate of ammonia and S. C. "floats," but never with potash salts, except so far as they may have been a constituent of purchased fertilizers. The present condition of my soil is very good, being capable of growing good cabbages anywhere, and all of it except where the fruit trees have obtained full possession, is run as market garden, the neighboring villages having grown to have largely a manufacturing population. I am satisfied that this kind of farming can be carried on successfully without dung, yet better with it.

LIQUID MANURE.

"It has been suggested that as liquid manure is weak in phosphoric acid, the addition of "floats" or other phosphatic material would greatly help it. The addition of "floats" or bone meal to sawdust or some other good absorbent for use in the gutters is suggested. What is needed to fix the ammonia formed by fermenting manure, is either some strongly absorbent substance like vegetable mould (or humus) or some acid substance or salt capable of combining with the ammonia. The "floats" are neither absorbent nor acid, and while they would even up the deficiency as regards phosphoric, they would have little retentive power. If you could get your floats into form of acid phosphate by cheap sulphuric acid, the material would do just what you want. Sulphuric acid (chamber acid) does not cost to the manufacturer more than \$5 a ton, and could be sold with profit for \$7.50 a ton. If you could induce some manufacturer to make a simple acid phosphate and sell it for a low price, it would meet your case. Why not use sulphate of iron to fix your ammonia, and then add your floats to bring up the phosphates? The copras would cost not more than \$20 a ton, and a few pounds

would go a long way in arresting the loss of nitrogen from putrefying urine."

Ag. College, Mich.

PROF. R. C. KEDZIE.

Brown, or chamber acid, is sold in London for \$15 a ton. The price charged here is something exorbitant, but there is the duty to be taken into account. The following, from the R. N.-Y., is the true way of preserving the liquid dejections. For our small Quebec stock 7 feet square would be enough for a box. A. R. J. F.

I keep my cows in box stalls 2 feet deep with tight floors. By keeping plenty of bedding under them and throwing in dry horse manure, I think I save most of the liquid manure. Passaic Co., N. J. P. H. L.

R. A. Soc. Horse-shoeing Competition

On Tuesday and Wednesday a large number of smiths took part in the competition in the shoeing of hunters. Many of them did their work well, and there was some trouble in making the awards, which were as follows: - First, £6, and

the freedom of the Worshipful Company of Farriers, Samuel Palfra, Sadler Gate, Derby; second, £4, and £2 added by the Lincolnshire Society, Thomas Sewell, Bracebridge, Lincolnshire; third, £3, George Green, Weedon, Northamptonshire; fourth, £2 and £1 added by the Lincolnshire Society, John Hutton, Scramblesby, Horncastle; fifth, £1, William B. Milner, jun., Kirlington, Southwell; highly commended, Herbert Benjamin Sewell, Lincoln; and commended, Thomas Mettam,

Sleaford. Each man had to make two shoes, one of which had to be put on the horse and the other left for the inspection of the judges. The shortest time taken was 39 minutes, and the longest 88 minutes. The winner of the first prize was 43 minutes over his work.

On Thursday and Friday the competition was in the shoeing of cart horses, in which there was again a large number of competitors.

The work was well done by so many of the smiths that the judges highly commended six men, after awarding the five prizes.

IS SALICYLIC ACID A SLOW POISON.—Salicylic acid in frequently repeated small doses has been pronounced by commissions of medical men injurious to the health, although the experimental ground for such a verdict has not been made public. To test the matter Kolbe took fifteen grains daily in his drink for nine months without suffering any inconvenience. Dr. Lehman gave to two laborers in Munich during

three months about half this daily dose, without inducing any apparent derangement of the system. It seems probable from these experiments that the prejudice against salicylic acid as preservative agent in articles of food and drink is not well founded. At the same time we have in benzoic acid an agent equally efficient, against which no such prejudice exists.

—Pharmaceutical Era.

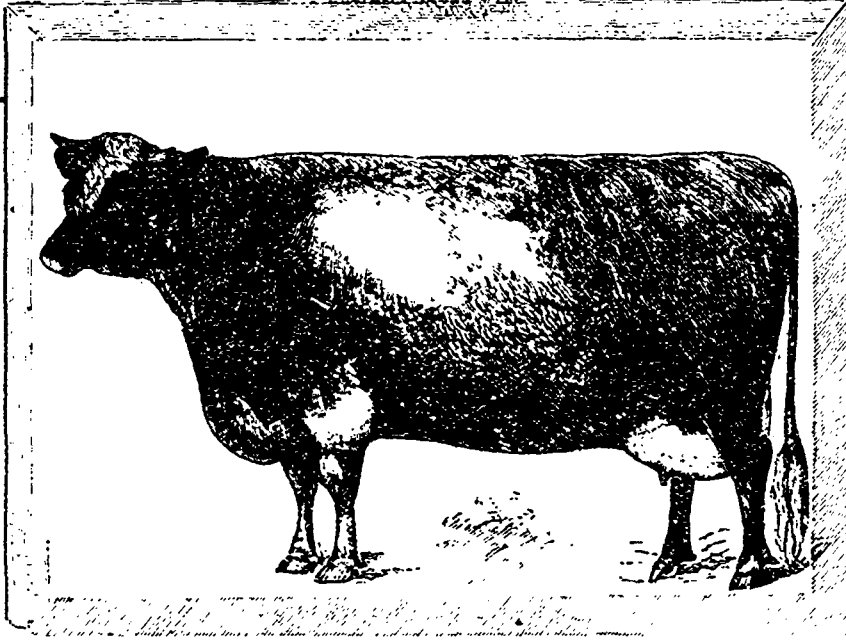
Soap is dear, and potatoes are cheap. Then what could be better than to make general a practice referred to by the *North British Agriculturist* as adopted by a Parisian laundryman of using the latter in place of the former? A correspondent of the journal named facetiously suggests that there is very little difference between the two, taking the potatoes now on sale in Scotland as specimens of the tuber. That, however, is a joke, and the subject is serious. Potatoes are a drug in the market—in rural districts at any rate—and soap is one of the most expensive articles of everyday and extensive household use. Then, if there be any cleansing property in potatoes which makes them fit for manufacture into a new form of

soap, by all means let Messrs. Pears inquire into the matter. The Parisian laundryman boils his tubers for use in washing his linen, and it is said that he finds the plan so effectual that he has given up the use of soap, soda, and bleaching powders entirely.

Keeping Cabbage in Winter.

In answer to the inquiry made a few weeks ago in our columns, for a good way to keep cabbage in winter, a friend gives in substance the following: He divides the cabbages he

intends for use, into three different lots. He selects a few of the first, and apparently the most mature, and places them on the damp floor of a cool cellar, where they will keep without harm for a few weeks as they are gradually used for the table. The second lot, intended for mid-winter, in larger numbers, have the roots and rough leaves trimmed off, and are then packed in large boxes in the cellar, all the vacant spaces between them being closely filled with slightly damp moss. Chaff will do nearly as well, if the air of the cellar is not too dry. In some cases, forest leaves answer quite well, if not left so long as to rot. The third and largest lot is buried out doors. For long keeping this mode is best, as they have the natural moisture and coolness of the earth, without much fluctuation, the mode being similar to the use of large boxes, using the earth in dug trenches instead of boxes. It is of course important to select a gravelly and sheltered place where there is a natural drainage, or else to provide a drain on the lower side so that the bottom of the trench or pit will be always free from water. The trench may be three



PRIZE ENGLISH DAIRY SHORTHORN COW CHRISTINE.

feet wide and a foot and a half or two feet deep; and where there are many cabbages to bury, it may be dug with the aid of a common and a subsoil plow, the loose earth being shoveled out. Place a few inches of coarse brush or small poles in the bottom, and on these coarse straw. Trim the roots and coarser leaves of the cabbages and then place them upside down, compactly, in the trench, three or four in width of the trench. If this is deep enough, three tiers may be placed in them, closely packed, highest in the middle to give the form of a roof. Cover with straw, stiff rye straw is best, and afterwards at first with a few inches of earth. A slight freezing will not hurt them on the occurrence of a cold snap if the thawing is gradual. Ventilation should be provided at the ends and at regular intervals, by piles at the top filled with straw; or if long rye straw is used, the upper ends may be left uncovered to serve for ventilation. Before the final freezing up for winter the earth covering may be increased to nearly a foot—the thickness of earth being less if there is plenty of straw. More straw and less earth is a good rule, and the ventilation will also be more perfect. Warm or open winters will require more care in ventilation than continuous severe winters, and special care must be taken to prevent too close confinement and rotting. The finer the earth is pulverized, the more perfect a non-conductor of heat it becomes when used for covering.

The advantage of this mode of keeping cabbages over boxes in the cellar is the uniform low temperature, nearly down to freezing, from the walls of the trench; at the same time that the earth furnishes enough moisture to supersede any of the moss packing, the cabbages being in close contact with it and with each other. As soon as thawing weather occurs towards spring, the cabbages will be found in excellent fresh condition; and if needed they may be taken out during winter by breaking the earth cover with a crowbar. A modification of this mode of covering may be adopted where plenty of evergreen branches are to be had, by placing six or eight inches of forest leaves on the rye straw, and on these—to prevent the winds scattering them, and to turn the rain—several inches of evergreen branches of the right length, upside down.

The Wheat Crop in England.

Sir J. B. LAWES has communicated to the press his annual letter on the probable wheat yield of the current season in Great Britain, from which we give the following extracts:

The wheat crop of the present year, which has hardly yet been secured over the whole of the British Islands, was at one time supposed by some to promise to be one of the worst of the present century and probably as bad as that of 1879. Very little consideration of the characters of the two seasons is, however, sufficient to show that the year just past was much more favorable to the wheat crop than that of 1878-9. While the mean temperature was below the average in both seasons, both in the winter and the summer, not only was it not so low during the growing months of 1888 as in those in 1879, but there was a very great difference in the rainfall of the two seasons; for while in 1878-9 there was a great excess of rain throughout the winter, spring, summer, and autumn, there was in the season just past a considerable deficiency throughout the winter and spring, and only an excess in June, July, and part of August; September again being, upon the whole, a dry month. The great influence on the subsequent growth of wheat, of the weather before the period of active aboveground growth, was clearly illustrated in our paper on "Our Climate and our Wheat Crops" in the case of the season of 1854. The summer of that year was comparatively cold and sunless; yet the wheat crop was one of the best of

the present century. The early winter had been unusually cold, but the remainder and the early spring were warmer than the average, and the season was extremely dry from seed time to harvest; the mild spring and the dryness obviously compensating for the deficiency of temperature during the summer months.

After reviewing the produce of the experimental plots at Rothamsted the present year Sir John concludes as follows: It will be obvious that, with a season showing such irregularities, it must be difficult to form an accurate estimate of the average yield of the country at large. The average, calculated in the usual manner from the results of the selected experimental plots, amounts to 26½ bushels per acre, at the standard weight of 61 lb. per bushel; that is, only about 1½ bushel below the standard average of 28 bushels. As already said, in adopting the average of the experimental results last year, as indicating the average of the country at large, it was supposed that the crop was under rather than over estimated; and it is possible that the figure for the present year may err some what in the contrary direction and rather over rate the crop of the country. There can, at any rate, be no doubt that the average produce of the harvest of 1888 is inferior to that of 1887 both of quantity and quality; but notwithstanding the irregularities and deficiencies which have been referred to, it is certain that in many cases much more than average crops have been obtained. I propose, therefore, to base my estimate of the produce of the United Kingdom this year on the experimental results without modification, leaving it to others and to the future to determine whether any deduction from the estimate so arrived at should be made.

Taking the average population of the United Kingdom for the harvest year 1888-89 at rather over 37½ millions (37,771,175), the estimate requirement for consumption, at 5.65 bushels per head, would be about 26½ million quarters (26,675,892). The area under wheat is reported to have been 2,663,436 acres, or nearly 300,000 acres more than last year. This area at 26½ bushels per acre would yield nearly 9 million quarters (8,947,480); and deducting 2 bushels per acre for seed, there would remain rather over 8½ million quarters (8,281,621); available for consumption, and there would accordingly be required about 18½ million quarters (18,394,271) to be provided from stocks and imports. It is admitted that the wheat crop, not only of America, but of some other countries whence we derive supplies, will be below the average. But during the last two months of the past harvest-year, our imports were at the rate of about 21 million quarters per annum, whilst with our late harvest, and the rise in prices, the supplies have been very liberal since, and there seems no reason to fear that there will be any difficulty in obtaining sufficient supplies to meet such requirements as the foregoing estimates show to be probable.

Rothamsted, Oct. 24.

A correspondent writing to the *Field and Farm*, says:

"Twelve of my thirty cows that were dehorned last winter aborted their calves in the spring, and five out of the thirty died. Those that lived are not worth more than two thirds their former value. With as good and even better feed than they had last year, they do not give more than half their usual flow of milk.

"That's nice, isn't it? Evidently here is a man that tried dehorning expecting some benefit from it, and don't propose to swear that black is white in order to stand justified before his neighbors because he was foolish enough to be caught by the "craze." We don't wonder at the result. Dumb brutes, unlike human beings, will stand a great deal of knocking around without misarrying their offspring, but when they

have to submit to the gouge and the saw and the knife, with all their attendant cruelties and necessary tyings and confinements, in order to perform the operation, we don't wonder they abort their calves."

A Talk in the Vegetable Garden.

EDS. COUNTRY GENTLEMAN—In a previous article I told how we managed to have a succession of peas and green corn through a long season. I believe however that I did not say that the corn may be made a week or more earlier by a little stimulating manure in the hill, but especially by early and constant cultivation. The first day you can see the corn coming through the ground, go over it with a garden rake or light hoe and break the crust, add from that time until it begins to show tassels keep it always clean and the surface mellow. This early planted corn and your first planting of beans may be caught by frost, but a little watchfulness and labor will enable you to save them. The trouble is that too often we persuade ourselves that there is not going to be a frost and take the risk, but it is wiser to protect the plants, when there is not frost, than to neglect them and run the risk of losing them. If the mercury does not go above 50° in the middle of the day and begins to fall by the middle of the afternoon, with the wind northwest and a clear sky, protect your plants. The best way I know of is to use dry saw dust, and the gardener should always have a supply of it as dry as it can possibly be. It is light and clean to handle and will not break or cripple the plant, and a single handful of it dropped on a hill of corn or beans will protect them thoroughly, and the next day with a light broom you can go over the rows very rapidly and brush it off and it will not injure the plants in the least. If any one knows a better way to protect plants from frost I should be glad to have them report it.

To have tomatoes by July 4, the seed should be sown in February. A cigar box will hold an abundant supply for a large family. Make a box 6 inches deep, and 10 by 16 inches, so that a pane of glass will cover it. This will hold two cigar boxes and enable you to start some other plant. Put two inches of saw dust in the bottom, set in your boxes and pack saw dust all around them level with the top. Now fill them with sifted earth, compact it and sow the seed. Keep the box in a south window, and protect it cold nights by an old coat. You can keep the plants in this a month, before they begin to crowd; then make a hot bed and prick them out, three inches apart each way. When they begin to crowd again, remove every other row and every other plant in the remaining rows to a cold frame, for by this time spring will be well advanced, and they will not need glass, but can be covered with boards on cold nights or cold cloudy days. If they are set ten inches apart each way they may stand here until they blossom and set fruit, and if the ground is thoroughly soaked and a ball of earth taken up with each, they will scarcely be checked in their growth by transplanting. This is some trouble but a single bushel of tomatoes the first half of July, will usually bring enough to pay for the care of all the plants. The plants for the late crop of tomatoes can be grown in a cold frame or even in the open ground with as little trouble as is required for cabbage plants. The season may be prolonged in the fall by covering a few square rods of late-set plants with light corn fodder when frost threatens, or the plants may be pulled up carefully and put in the cold frames with the fruit adhering to them.

To get the most out of a garden the land should be double-dropped as much as possible. Never let the lettuce, radishes, spinach and early peas stand a day after they are past use, but remove them, stir the land and plant with some quick maturing crop. I always plant these vegetables adjoining, as they mature about together, and I can then clear a strip

across the garden and work it with the horse and cultivator. The first planting of these will mature in June, and may be followed by beans, corn, cucumbers or late tomatoes. I always follow early potatoes with winter squashes, for as they will cover the ground if planted eight feet apart on every third row, a few of the hills can be dug early, and the seed put in and the crop have a month if necessary to mature in after the squashes are planted, before the vines will run to necessitate the digging of the potatoes. We always dig first a few hills around each squash hill. I have not failed in many years to grow a full crop of winter squashes in this way, and still not dig the bulk of the potatoes until the vines are dead, and the crop matured so as to keep perfectly. A few square rods of our garden we always devote to flowers. We plant a row of sweet peas 20 feet or more in length, and by a little care in clipping off blossoms and the pods that first set, we keep them in bloom for two months, and get a world of pleasure from them. A bed of daisies, petunias, phlox, a few dahlias and pinks, and a bed of everlasting grown in a corner of the garden nearest the house gives more pleasure, and are less trouble than if grown in the dooryard. Did I mention that our vegetable garden is directly back of the house within 25 feet of the kitchen door with no fence between it and the house, and so the good wife can look at it as she is about her work? We have a high fence between it and the orchard where the poultry run, and as we do not want chickens in the yard or garden, I prefer this to paling in the garden.

Buller Country, Ohio.

WALDO F. BROWN.

QUESTIONS ANSWERED

"Corinthian" sends us the following queries:

3. What has been the result of your experiments with "Floats" as a supply of phosphate?
4. Is cotton-seed meal safe to feed to pigs from two to five months old in any quantity whatever, if fed with shorts, apples, etc?
5. Is linseed meal fit to feed to veal calves, or other calves one month old and over, which are being fed on skim milk?

3. While in our practice we have found the flour-fine South Carolina phosphate, called "floats," to be quite as effective a fertilizer as ground bone, yet we sometimes fear that we have committed an error in advising its use by farmers generally. Floats supplies absolutely nothing to the crop but phosphoric acid, and unless there is present with it in the soil a sufficient supply of available nitrogen and potash, you may put on floats in any quantity without appearing to do any good. It is most astonishing how hard it is to make the average farmer understand this elementary fact. Quite a number, reading what we have written on the subject, have undertaken to use the floats in place of a complete fertilizer; and these nearly all report, and some have written to the papers, that floats is absolutely useless. This is gladly picked up by fertilizer men, who make their money not out of floats, but out of the mixed fertilizer which goes by the name of "phosphate," and is printed with a sneer at our "theoretical notions." This way of calling a complete fertilizer a "phosphate," has become so general that it probably will never be corrected. The fact is very much to be deplored, for it confuses the minds of men destitute of chemical knowledge. The "floats" is a phosphate and nothing else; but the "phosphate" which is commonly sold contains not only "phosphate" but also nitrogen and potash, making it a complete fertilizer. No one who understands this would ever think of using floats alone upon land requiring a fertilizer. He must have some nitrogenous material to go with it, and usually some potash. The reason why we buy and use floats and bone is because we

get our phosphoric acid very much cheaper in that way. We can also buy potash, in the form of ashes, close at home, much cheaper than we can buy in it a fertilizer, and we can get nitrogen as cheap separately as we can ready mixed. So, as a matter of economy, we buy our materials and use them, mixed or alone, according to the state of our soil and the kind of crop. For instance, if we were seeding to clover, we should put on bone, or floats, with ashes, but no nitrogen, because clover is able to get the nitrogen that it needs from the sub-soil, its roots going down four or five feet.

Another point in our practice is different from that of most other farmers. We aim to keep our land manured ahead, so that we could grow two or three crops before it would show signs of needing more manure. Doing this, we can use a slower fertilizer than where it is necessary to supply all the elements of plant food in an immediately soluble form. And these slower fertilizers (so far, at least, as their phosphoric acid is concerned,) cost so much less that we can get enough for three or four crops at the cost of what we must use for one crop, if the highly manufactured and very soluble form is taken. The manufacturers are very fond of calling the slowly soluble phosphates "insoluble", and the chemists themselves authorize this mis-statement by using it themselves in their official analyses. To be sure, they say afterwards that by insoluble they do not mean insoluble in the soil, but only that it is insoluble in their solution of ammonium citrate, which they use in making their analyses. They admit that this "insoluble" phosphate is soluble, by attaching a value to it in their analyses. If it were really insoluble, it would have no value at all to the farmer. The real truth is that the phosphoric acid of bones, and of the soft mineral phosphates, like the South Carolina floats, and the "phosphate meal" lately introduced, are quite sufficiently soluble,—as soluble as the phosphoric acid naturally present in all fertile new soils, which will produce crops for some time without any manuring. The only thing needed is that we put on a larger quantity at first, because only a third or a quarter will become freely soluble the first season. Now, as we can get three or four times as much phosphoric acid in floats as we can get in a complete fertilizer for the same money, we think it economy to buy it, put on three or four times as much, and let the crop be three or four times as long getting it. In this way, so far as phosphoric acid is concerned, we manure for three or four seasons at the cost of manuring for one season with an acid phosphate.

4. We should much prefer linseed meal to cotton-seed for feeding to young pigs; but we think shorts probably quite as good, if fed in milk. The shorts and milk furnish the same elements as the oil meals, except the fats, which are mostly absent in skimmed milk. By the new process, nearly all the oil is taken out of linseed, so that the linseed-cake has only three or four per cent, or less than new milk. There is something in cotton seed which makes it differ from linseed, in being usually much less digestible, especially to young animals. Even with mature beasts, we have to be more cautious in feeding cotton-seed meal than linseed.

5. Yes, linseed is nice for calves, if feed with discretion, in connection with other food. But the new process linseed cake, having the oil so completely extracted, is inferior for this purpose to unpressed linseed meal. For feeding, linseed meal with the oil in it is much the best,—which is not true of cotton seed.

DR HOSKINS.

The sale of grade Percheron horses made by Messrs J. D. & L. B. Smith, at Walnut Hill Stock Farm, near New Berlin on the 24th of Oct. was well attended. The animal were nearly all in excellent condition and well deserved the complimentary remarks their fine appearance called forth. The

weather was exactly right. The lunch was one of the best, and C. C. July, the popular auctioneer was never in better condition for a good afternoon's work. As the result shows he did his part well. The sale was certainly the best of the season in Sangamon County.

Considering the quality of the stock of the good condition in which it was offered, the prices cannot be called high, yet they are such as to encourage our farmers in the rearing of good draft horses.

Forty-three mares and fillies, 2 to 8 years old, sold for \$5440, an average of \$152.00.

Eight Stallions, 1 year old sold for \$970 average \$121.25.

Fourteen geldings, 2 years old for \$1640, average \$117.14

Five weanlings brought \$340, an average of \$68 00.

One saddle horse sold for \$100.

The seventy one animals brought in all \$9590, or an average of \$135. Not a bad showing for grade stock, nearly all of them young and raised by the parties making the sale.

Prof. W. H. Henry, of the Wisconsin Agri Experiment Station has promised to address the National Swine Breeders Association a paper bearing on the industry it represents provided it is possible for him to be in Chicago at that time. Hon. N. J. Colman, Commissioner of Agriculture will discuss the prohibition of our pork products by the German and French governments. J. W. Pierce, of Indiana, will have a paper on the value of alsike clover for hogs, and Prest. D. L. Thomas will have a good address for the occasion.

The membership is now more than a third larger than it was a year ago, and names continued to come in, that they may be reported at the coming meeting, which promises to be the largest yet held.

Though every reputable swine breeder in the country cannot find it convenient to attend these meetings, all have the privilege of becoming members and thus having sent them as soon as published a copy of the proceedings, including the addresses and discussions. PHIL THRIFTON.

Springfield, Ill.

NON-OFFICIAL PART.

CONSUMPTION CURED.

An old physician, retired from practice, having had placed in his hands by an East India missionary the formula of a simple vegetable remedy for the speedy and permanent cure of Consumption, Bronchitis, Catarrh, Asthma and all throat and Lung Affections, also a positive and radical cure for Nervous Debility and all Nervous Complaints, after having tested its wonderful curative powers in thousands of cases, has felt it his duty to make it known to his suffering fellows. Actuated by this motive and a desire to relieve human suffering, I will send free of charge, to all who desire it, this recipe, in German, French or English, with full directions for preparing and using. Send by mail, by addressing with stamp, naming this paper—

W. A. NOYES, 149 Power's Block, Rochester, N. Y.

FOR SALE.—Percheron, Norman and Briton Horses, Ayrshire cattle, Berkshire pigs, Plymouth-Rock poultry, apply to Mr. Louis Beaubien, 30 St James Street, Montreal.

DARWIN'S THEORY.

Darwin's theory of the "survival of the fittest" is simply that the weakly die, while the robust and hardy thrive and live. How true this is of all seed growth, and how necessary to sow only that which is suited by nature to live and develop.

D. M. Ferry & Co., the great Seed Growers and Seed Dealers, of Detroit, Michigan, supply only the best and purest, raising their own seeds by the most improved methods and with the greatest care, bringing to their business the invaluable aid of more than thirty years' experience. Their Seed Annual for 1889 is a real help to the gardener and should be in the hands of all who desire to purchase pure and true seeds. Send your name to the firm's address at Detroit, Michigan and they will forward you a copy.

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