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THE CANADA FARMER

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The Field.

Abandonment of the Furrow.

It seems that the introduction of steam in England as a motive power for the tillage of the soil, is resulting very extensively in the abandonment of the furrow system of culture, and the substitution for it of a system of soil-stirring, similar to that produced by the sub-soiler In other words, the steam-plough is bringing about the abolition of ploughing In all stubble and fallow work, a deep-tined grubber or cultivator is used instead of the share, and the soil is torn up and loosened without being reversed. The tillage is deep, but the soil is kept at the top, and the sub-soil is simply loosened where it lies. By this means, the chief advantages of deep ploughing are secured without their attendant evils. The soil is opened to the action of the air and moisture, is well drained and protected against drought, without the richer surface soil being buried away out of reach of the influence of sun and air, and of contact with plant roots. It is a common-sense and effective system of cultivation, and one which is worthy of experimenting on in horse as well as steam tillage. More power is needed to overturn and reverse the position of the soil than is requisite merely to stir and loosen it up, while it is manifestly of advantage to retain the best soil near the top, so as to promote the early and rapid growth of the young crop. We believe that much of the difference of opinion as to the comparative merits of deep and shallow ploughing, may be traced to diversity of methods. To bury a rich top-soil below a hungry, barren subsoil, can only result in disappointment and loss, and this is why so many who have tried it report against deep ploughing They have embalmed the wealth of the land, but put it out of reach for present use. But deep tillage by means of grubbing, tearing and loosening the soil must be beneficial, and the more the land can have of it the better.

Ploughing in Winter.

Our newspapers have recorded several instances of ploughing in January the present season. This is unusual for a climate like ours. No doubt most people regard such cases of winter ploughing as mere feats to brag about. But the fact is, it is desirable to plough in winter, if it can possibly be done. A correspondent of the *Country Gentleman* gives his experience and views on the subject of winter ploughing in a recent number of that journal, as follows :—

"It is not often that winter ploughing can be practiced in this (43d) latitude. But when it can I have found it to be of the greatest advantage, especially if, as now, it is preceded by frost penetrating the arable soil. It is sure to come up mellow, unless unusually heavy and compact, and then greatly ameliorated. The advantages beside this mellow condition, are not a few, some of which cannot be obtained otherwise. The ground is freshly thrown up to the cold air, or at least cold enough to chill and benumb what vermin may be exposed; the frosty nights alone would do this. The seeds of weeds that had some protection in the deep soil are now fully exposed, the frost, rains and snows having a great influence. Then this fresh soil, disintegrated by plow and frost, is thus laid open through its pores to the immediate influence of the elements, which further disintegrate and mellow it. Besides, there is less snow to pack now, part of the winter having passed. The plowing is between the fall and spring plowing, and partakes of the nature of both, getting the full benefit of both in addition to its own special advantages. There is, to a greater or less extent, the looseness of the soil deep down which we get in spring plowing, also the absence of grass and weeds which get started in fall plowing, especially when early performed. The gain in work which we get in fall plowing is also secured in winter plowing, a time when there is no farm work done, unless specially favored with mild weather. The gain, therefore, at a time when labor is worth little, is considerable. The land newly and loosely thrown up will also take in the rains and melted snows, and gradually pass them off instead of keeping the more compact body of the soil wet, sometimes visible on the surface. Fall plowing will show this in the spring very frequently. It is seldom seen on land plowed in the spring or winter, particularly late winter. Further, there is no evaporation of the fertilizating gases of the soil, which the direct heat of the sun in summer produces. The fertility of the rains and snows is retained.

"I have had the chance offered me several times during the course of my life for plowing in winter. Uniformly, the results have been good. Perhaps we ought to expect some wet places, which plowed at any time, without under treatment, would have done poorly. But, in the main, there was a mellow opening in the spring, and an earlier chance for working—the soil being porous, and drained beyond what was usually its condition, so that it was fit for the harrow several days (and possibly a week) earlier than would have been the case with fall plowing. This is the land for seeding down. It can be done early and on the best of seed beds. The grass seed or clover brushed in, there can be no failure if the ground is rich enough. If not rich enough, manure may be drawn on it and spread immediately after plowing. This may also be done on any plowed land open in winter, and it should be done then if neglected in the fall.

"Our summer was a cold one. The cold continued through the fall and into December, and in addition to the snow gave us a full winter in effect. If there is a law of compensation in the weather, the rest of our winter, or a part of it, ought to be mild, so also prophecy and scientists. Already this seems to have taken place. To-day, December 12th, the snow, which was two feet in depth, has about all disappeared, and there is little frost left in the ground. There is, therefore, a prospect for an open and mild winter. It needs not many favorable days to prepare the ground for the plow. Farmers should keep themselves in readiness to test the matter should the weather favor them. Land plowed early in the fall may be re-plowed now to advantage, if the weather admit. But in no case plow if the land is not dry enough. Do not think the frost will remedy it. It will do it only in a measure—not sufficiently to counterbalance the hurt. If it comes up mellow, or loosened of sod and not greasy, it is in the right condition for the plow. Plow as deep as the land will bear."

Premium Potato Growing.

Last spring, the Messrs. Bliss and Sons, prominent seedsmen in New York City, being anxious to disseminate some new varieties of potatoes, and at the same time show what good cultivation would do, offered $500 in premiums for the largest yield of the Early Vermont and Compton Surprise, two recent seedlings of considerable promise. The conditions were, that the competitors should make oath as to the accuracy of their statements respecting mode of culture and quantity of product; also, that they had resorted to no other mode of propagation than that of planting in the usual way—no forcing or propagation by means of slips having been resorted to.

The results have been published, and are certainly most remarkable, as proving what high and skilful culture would do in so old and worn a rut of husbandry as potato-raising. We are indebted to the *New York Tribune* for the following account of the best yields obtained in this important contest :—

EARLY VERMONT.

First premium, $100, to J. I Salter, St. Cloud, Stearns county, Minn., 609 pounds.

Second premium, $75, to H. C Pearson, Pitcairn St Lawrence county, N Y, 437 pounds.

Third premium, $50, to J. L. Perkins, Little Sioux, Harrison county, Iowa, 393½ pounds.

Fourth premium, $25, to Thomas J. McLeod, Black Brook, Clinton county, N. Y., 380 pounds.

COMPTON'S SURPRISE.

First premium, $100, to Abednego Robinson, New Market, Rockingham county, N H., 511½ pounds

Second premium, $75, to H. C. Pearson, Pitcairn, St. Lawrence county, N. Y., 450 pounds.

Third premium, $50, to J. I. Salter, St Cloud, Stearns county, Minn., 394 pounds.

Fourth premium, $25, to Franklin A. Smith, Stone Church, Northumberland county, Penn., 376 pounds.

The most conspicuous of the competitors who just failed of securing the premiums, but whose success was highly creditable and deserving of honorable mention, are included in the following list :—

POUNDS.—	*Early Vt.*	*Surprise*
A. W. Titus, Wilmington, Windham Co. Vermont	251	370
Saml. Neal, Wyocena, Columbia, Co. Wis.	320	276
E. S. Brownell, Essex Junction, Chittenden Co., Vermont	335	368½
Leonard Wood, Morrisville, Lamoille Co., Vermont	223½	320½
H. P. Sharpless, Fairville, Chester Co., Pa.		338¾
Eugene E. Graves, Black River, Jefferson Co., N. Y.		325¾
James R. Aten, Belvidere, Warren Co., N. J.		350
David R. Wood, Morrisville, Lamoille Co. Vermont		369½
Fred k Seiler, Verono, Essex Co., N. J.	131	384½
H. S. Goodale, South Egremont, Berkshire Co., Mass.		319¾
Robt Sutor, Brady, Indiana Co., Penn.	336	
Chas. Whiting, Jasper, Steuben Co., N.Y.	307	

We have evidence here of what may be accomplished in the way of increasing production by selecting choice seed, manuring well, with suitable fertil-

isers, and bringing thoroughly skilful and industrious culture to bear on the desired end The same means which made one pound of potatoes yield 600 pounds, could make a hundred bushels yield in like proportion. Messrs. Bliss's first premium was given for a yield at the rate of at least 1000 bushels per acre, that is on the supposition of one barrel of potatoes cut to single eye, being enough seed for one acre. What can be done on one acre can be done on a larger area, and what one man can do, another can do. We have here the whole theory of high farming in a nut-shell, with a practical home-appealing illustration. The most ignorant man who never read a line in an agricultural book or paper, thinks he can grow potatoes, and does it after a fashion, but there is a mighty difference between 100 and 1000 bushels to the acre. It is a waste of land, time, interest, and profit, to pursue the system of poor, low farming, now so much in vogue. Good farming alone really pays. That must pay and will. When it ceases to do so, no other kind of business will prospor, for all else depends on profitableness of farming.

Fertilizers—Composting Muck.

The Chairman of the New York Farmers' Club read the following communication from Dr. O. S. Stillwell:—

"A farmer in Saratoga Co., N. Y., asks for information respecting the treatment of a new farm he has purchased. He describes his land as a sandy loam, poor, and run out, but naturally good.

"In describing the qualities of land it is always well to give the character of the trees growing upon the soil, or those which thrive best, or whether hard or soft wood, whether birch, maple, hickory or pine In this way you arrive at facts. To say soils are loamy, clayey, or sandy, gives a vague idea as to their latent qualities. Our grand-mothers, in setting up a leach tub for soap, always selected hard wood ashes to fill it, for experience has taught that only from these could potash be obtained So, when a farmer sees hickory, maple or oak, growing here and there on his farm, then the fact is established that his land contains potash sufficient for ordinary crops, and intelligent cultivation will soon bring it up to a high condition. There is no general specific treatment for soils. Instruction or advice must be conducted on general principles, and the successful application depends upon the intelligence of different parties. The question is asked—what fertilizers are to be used to obtain economically the best results? How to use and compost swamp muck?

"A person who possesses a bed of swamp muck upon his farm is apt to believe he has a bed of ready made manure. He will be disappointed Swamp muck is much overrated and underrated. It is valuable, and at the same time it may not pay for carting. It will pay fivefold by proper manipulation Let us examine its composition, and how formed Muck, or humus, is generally the deposit found at the bottom of ponds and lakes, or where they have been filled up through the course of ages by the decomposition of water plants. All water plants are deficient in agricultural salts. If you plant grain upon a bed of muck, you obtain at first a rank growth of straw, which soon breaks down, or 'lodges,' as the farmers say, from a deficiency of the silicate of potash, and no grain will be formed. Notwithstanding it is valuable when first carted out, it is sour muck, and unproductive If you take a barrel of clean sand and pour liquid manure upon the top, it will leach through the same; but if you will place a layer of dry muck in the barrel the liquid will come through clear, showing the muck has absorbed the manure. Here, then, is a valuable quality, showing it possesses the qualities of carbon in the soil. Again, it imparts a dark color to soil and absorbs heat. I believe the best treatment of it for manure is the following: Cart it out from its bed in the autumn or winter to be acted upon by the winter frosts. The chemistry of nature is most wonderful, and not appreciated by agriculturists. The frost and sun sweeten the humus and decompose it. If hard wood ashes can be purchased up to twenty-five cents a bushel, they are the best for composting with muck, next lime By mixing ground bone with wood ashes, and wetting or dampening the heap, letting it lie for a few weeks, then composting with swamp muck, you will have a special manure for potatoes, or for top-dressing for any grain or grass. Cart out muck for your cattle to stand upon, put it into your pig-pens and hen-coops. Place a heap near the house where the slops of the house can be thrown upon it, and use it as an absorbent for liquid manure. Economize your labor, for labor is money. Cart out your manure from your pens at convenient times, irrespective of season, upon your grass land, or land you intend to cultivate Spread it upon your land at any time, except when it is frozen. Instead of ploughing your manures in deep, with a plough, harrow them in upon the surface. Do not listen to those who tell you they will waste and pass off in the atmosphere. Wage an incessant war upon weeds Do not sell any hay off your farm unless you buy ashes or bone with the proceeds. Give your cattle warm stables. They will not eat so much. Give them plenty to eat, with variety, and oil meal to improve the manure. Dig up head lands—ridges under fences—for your compost heap, and collect all heaps of leaves for your pens and yards."

The Fuller's Thistle, or Teazle.

The invention of man has sought out many contrivances, and it is quite wonderful to see the many operations in the arts that were formerly performed only by cunning fingers, now performed by machinery which is carried on with all the perfection of clock work, and which does its work with an accuracy unsurpassed by hands guided by human intelligence. Fingers have been made that feed printing presses, that pick up shoe pegs that put metallic eyelets into shoes, and that do a hundred other things a thousand times faster than human hands could do them. But there are certain processes that no machine can perform, there are important operations in the arts upon which the inventive genius of man has made no improvement. With all his skill in the creation of chemical dyes, nothing has yet been found to take the place of indigo in coloring blue, and for that particular finish upon woollen cloth known as "raising the nap," no invention has yet been found to take the place of the teazle, or fuller's thistle, the ripened head or fruit of a plant known to botanists as *Dipsacus Fullonum*. This plant is remarkable for producing at the end of the little leaves at the base of its flowers, called bracks, a spine which curves downwards, and this acts as a kind of hook brush for pulling up loose particles of cloth. It is just stiff enough to raise the nap, but too yielding to tear the cloth. Various substitutes for the teazle have been tried but all to no purpose. Formerly, these teazles were held in the hands of workmen, and pulled across the web of cloth suspended on a frame before them—now they are attached to a cylinder which revolves upon the cloth, and the loose particles are raised so they may be easily sheared or cut off to give the goods the fine appearance it assumes after this process is completed The plant is a native of the south of Europe, the Levant, and the Cape of Good Hope; but has become naturalized in this country and grows in hedges and road sides from Massachusetts to Louisiana. In some parts of England it is made a leading crop, a good yield per acre being five "packs"—so called, each "pack" consisting of about twenty thousand heads, and worth $25, or $225 per acre. The cultivation of the teazle is a somewhat uncertain business, it is an exhaustive crop, and its culture is seldom carried on in good farmed districts.—*Maine Farmer.*

Cheap Board Fence.

Usually in the winter most of the farmers cut and haul out what logs they wish to saw for fencing boards. I think that there is too much lumber used in the fences for profit. Some six years since we built a board fence, and it is seeming as good to-day as when put up and stands as fair. The posts were some old joists we took from a building when we took it down. They were four inches square set in the ground two and a half feet. The boards were four inches wide and one inch thick, fifteen feet in length, one post in the middle and one at each end. The top of the first board was nailed four feet from the ground and the others were put equal distances apart from each other. This fence is not raked by the wind nor does it stop the snow, and it gives full protection from the cattle.

At $15 per thousand feet the boards only cost 30 cents for 15 feet in length, and our readers can guess at once the cost of the posts We think it preferable to split with a saw all posts that are large enough, so as to have a fair surface to nail to, and it makes the fence stiffer. Also the flat surface in the ground stands better and will not be racked so much by the force of the wind. Farmers can just as well cut their logs the right length, and save lumber

We had one pasture of nearly a hundred acres, which we fenced with only one board, in height 3½ feet from the ground, and found no difficulty in keeping the cows and horses in the pasture.—*Cor Maine Farmer.*

POTATOES IN NEW-HAMPSHIRE.—At the late meeting of the New Hampshire State Board of Agriculture, reports were made of crops ranging from two hundred and fifty to five hundred bushels of potatoes per acre. Most of the surplus crop in that State is made into starch. One bushel will make, on an average, eight pounds of starch, for which is received from six to seven cents per pound. One bushel of potatoes was exhibited in which were just forty potatoes. In Coos county, oats yielded from fifty to seventy five bushels per acre.—*Co. Gentleman.*

PROFITS OF GOOD CULTIVATION.—A correspondent tells the *Western Farmer* that from less than four acres he gathered a crop of onions worth $2,450, as they yielded at the rate of 1,045 bushels per acre, and cost at least $200 per acre. He adds that he does not believe that a single acre of that land would ten years ago have produced 50 bushels of the odorous esculent in question, and he shows plainly that good cultivation is the secret of his success, for he says, "small crops will not pay; moderate crops are little better; large crops pay well, and very large ones will pay splendidly every time."

ARRESTING DECAY IN POTATOES.—Various plans for arresting decay in potatoes after digging have from time to time been made public, such as dusting with quicklime, gypsum, charcoal dust, etc. Prof. Church, of Cirencester, England, the eminent agricultural chemist, announces that sulphate of lime appears to exercise a very remarkable influence in arresting the spread of decay in potatoes affected by the potato disease. In one experiment the salt was dusted over some tubers, partially decayed from this cause, as they were being stowed away. Some months afterward the potatoes were found to have suffered no further injury. A similar trial with powdered lime proved to be much less effective.

JOHN JOHNSON of Geneva, writes to the *New York Tribune* "that farmers should keep less land under tillage, keep more stock, make more manure, or at no distant day their harvests will fail, even on drained soil. There is no other country where Mother Earth is so poorly fed as in these United States. It never pays to raise a poor grain crop, and, excepting in a bad season, which comes less frequently in this country than in Great Britain, I see nothing to hinder our getting as much per acre as our British brothers. Fifty years ago 20 bushels of wheat per acre was thought a good crop in that country; now, by draining and manuring, their average in a fair season is about 28 bushels per acre. I have often had over 30 bushels average. In 1833 I had an average of a little over 42 bushels."

PREMIUM CROPS.—The following are some of the crops reported for premiums offered by the Bristol county (Mass.) Agricultural Society: Mr Reed, of Easton, raised 132 bushels corn to the acre, worthy a premium for a Bristol county farm; Mr. Eddy raised 114 bushels of Western corn; Mr. Short renders 103 bushels to the acre, but owing to a misunderstanding, did not make return in season for a premium; Mr. Williams and Mr. Dean over 80 bushels. Mr. Williams also raised 424 bushels of potatoes to the acre, and Mr Pratt nearly 400 bushs; Mr. Williams also raised 28 tons of cabbage on the acre, taking three premiums; Mr. Easterbrooks raised 42 tons or 1,400 bushels of mangel wurtzel on the acre, the largest crop on record; and Mr. Alger raised 28 tons; Mr Simmons raised 80 bushels of oats. Mr. Thayer made a crop of hay of over four tons to the acre.

POTATO TUBERS.—The old idea was that a tuber, as a whole, was but one seed, like a kernel of corn. But we now consider a potato tuber like an ear of corn containing many seeds, each of which is capable of producing a plant equal in strength and value to the whole combined. Of course there are hundreds of farmers who will, and do, cling to this old theory despite of all the science and practice to the contrary. We should think, however, that the enormous yield secured from the various new sorts within the past few years and frequently referred to in the agricultural journals, all of which have been produced from cut seed, would begin to awaken the sticklers for whole seed and set them to making experiments in this direction No one will suppose for a moment the yields reported in the case of the Bliss prizes for the Early Vermont and Compton Surprise could have been secured by planting whole tubers. Those farmers who believe that whole tubers are best for seed should look at these figures—511½, 607, 437 and 456 pounds, raised by different men in different localities, each having but one pound for seed. We think these facts and figures are worth a dozen theories, and well worth remembering at planting time.—*Rural New Yorker.*

Grasses and Forage Plants.

Laying down Land to Grass.

This is an important process, requiring far more judgment and care than are usually bestowed upon it. The practice is but too common, of cropping land to grain until it is pretty well exhausted, and then seeding it down, as though grass required little or no fertility of soil to sustain it. To this mistake may be attributed many of the failures, and much of the disappointment connected with the branch of farming now under consideration.

In England, where the richness and permanence of meadows and pastures are proverbial, it is regarded as essential that the soil should be in good heart, and in a clean condition before laying it down to grass. No intelligent farmer in the old country would think of seeding down a field that had been neglected, or had become foul with weeds. A field in such a state would be summer-fallowed, and treated to deep and frequent cultivation, as a preparative to the purpose to which it was to be devoted. Drainage and liming would also be resorted to In this country, one or two well-manured, hoed crops form an excellent preparation for grass. It is essential to the best success that there should be thorough preparation in some way or other. The idea that land in any condition, no matter how run out or dirty, is good enough for grass, ought to receive no countenance from sensible farmers, anywhere, at this time of day.

Supposing the land to be in proper tilth, regard should be had to the question whether mowing or pasturage is desired A grass well adapted for meadow, may be quite unsuitable for pasturage. For example, timothy, one of our best grasses for mowing, is not equally good for pasturing, as it cannot bear close cropping by stock Whatever the object in laying down to grass, it is advisable to sow a mixture of seeds. If meadow is desired, a selection should be made of such species as come into flower about the same time. On the other hand, if pasture is wanted, such varieties should be chosen as will keep up a fresh and successive growth from early spring until late autumn. The chief grasses desirable for mowing are timothy, red-top, white bent, orchard grass, perennial rye grass, June grass, rough-stalked meadow grass, meadow fescue, and tall fescue. No place is given in this enumeration to the clovers, because it is customary and best to use them in a rotation with other crops, and to allow them to occupy the soil only for a year or two as a recuperative change. The prominent varieties best fitted to form pasturage, are meadow foxtail, orchard grass, red top, sweet scented vernal, June grass, meadow fescue, and yellow oat-grass. The choice of kinds, and the proportion of admixture, are matters that require judgment in view of peculiarities of soil, climate and exposure. A liberal supply of seed is advisable in all cases.

The question has been much discussed, whether to sow grass seeds by themselves, or with a grain crop. Both methods have their advocates, and as usual in greatly debated matters, much may be said on both sides. The safest answer to the question is, "*that depends*," mainly, on climate; where moist and cool, sow alone; where drouthy and hot, sow with grain. Sown alone, the young plants get rooted more quickly and strongly, and have the full benefit of all the fertilizing material in the soil. Sown with grain, they have partial shade with its accompanying moisture, at the cost of what the grain crop consumes for its support. In this country, the safer plan is to sow with grain, though we have known lone sowings to turn out very well But we are now so subject to dry, hot summers, that it is rather hazardous to sow grass by itself. Wheat is the best grain to seed down with, and winter wheat is preferable to spring. It is becoming somewhat common to use barley as a seeding-down crop, but we find the best practical farmers in England objecting to it from its peculiar habit of growth. The roots are spread immediately under the soil, and feed principally upon the upper layer. This peculiarity of barley, not only deprives the young grass plants of needed sustenance, but leaves the surface of the land in a loose puffy state, unfavorable to the well-being of the succeeding crop. A well cultivated soil under, with a firm surface, are desirable conditions for grass, and they are secured with a partnership of wheat. When grain and grass are sown together, steps must be taken to renew the fertility of which the land is deprived by the grain. It is well to leave a long stubble, and no stock of any kind should be allowed to pasture the young grass, no matter how strong a growth it may seem to have acquired. Barn-yard manure is not considered a good application at this early stage of growth, from its tendency, however, well rotted, to smother down the feebler plants. A dressing of artificial manure is preferable. Superphosphate, guano, bone-dust, and sulphate of potash, are used instead. A recent English agricultural paper recommends the following admixture .–1 cwt. nitrate of soda, 2 cwt. superphosphate of lime, and 3 cwt. sulphate of potash; or, if equally cheap, 2½ cwt. of dissolved guano, and 3 cwt sulphate of potash After the first mowing, a liberal annual dressing of well-rotted barn-yard manure, liquid manure, or artificials must be given, if a respectable yield of hay is to be had. The plan of mowing year after year without manuring, associated as it usually is, with the sale of the hay off the farm, is the fatal road by which many a thoughtless farmer has travelled to poverty and bankruptcy. "Feed your land and it will feed you" is a maxium of universal application to crops, grass included.

When grass lands are intended for pasturage, the greatest care is needed not to graze them too early or too closely. A firm sward is wanted to prevent sharp hoofs treading out tender rootlets, and a sufficient range must be given to avoid such close croppings as would destroy the crowns or hearts of the young plants. Pasturage is, at best, an extravagant method of feeding stock. They destroy and waste a large proportion of the food nature provides for them. Their droppings, unless gathered up and composted, which is costly and troublesome, smother and kill the grass on which they fall, except in the case of sheep, whose ordure is usually sufficiently scattered to be beneficial rather than hurtful. As a general rule, only the half cleared and broken parts of the farm should be devoted to pasturage. It would be good economy to clear up thin patches of woods, taking off the decaying timber, brush, and rubbish; grubbing out useless weeds, bushes and saplings; and seeding down what is now, to a great extent, waste land. There are also steep hills and deep valleys, gorges and low-lying spots, unfit for the plough or the mower, which might be improved into good pasturages. Too often such places are left in possession of an utterly useless growth of shrubs and weeds. A riddance of these, a cleaning up of the surface by the removal of stones and rubbish; and a scattering of grass seed, would make these neglected parts of the farm both useful and ornamental. A wise economy would dictate that only such parts of a farm as cannot be turned to better account should be pastured. All waste should be avoided; both the waste of allowing animals to range over the rich and fertile field, that can most profitably be devoted to the scythe and mowing-machine; and the waste of permitting barren and unproductive places to exist as eye-sores, nuisances, and prolific nurseries of weeds.

Dairy Pasture—June Grass.

L. B. Arnold says in the *Live Stock Journal*. "As a plant for grazing, *Poa pretensis*, or June grass, has great significance with the dairy interest. It grows with a very light stem, its herbage being nearly all leaves that are narrow, long, soft, and rich in the elements of butter and cheese. Under favorable circumstances, they grow vigorously, and at lower temperatures than the leaves of most other grasses, starting early in the spring, and continuing late in the fall. They remain fresh and green a long time under the attacks of drought and frost. June grass is one of the most hardy grasses, and grows in almost all latitudes and all places, and under the most unfavorable circumstances. In the Eastern and Middle States and Canada, it is known as June grass; in the South and West, as blue grass, or Kentucky blue grass. Beside being rich in nutriment, it is invaluable on account of the fine aroma and nutty flavor it gives to butter and cheese. It also imparts the same fine flavor to beef and mutton. Though it yields a delicious butter, its best effects are seen in the cheese dairy. The cheesy matter derived from it is not only highly flavored, but its peculiarly soft texture renders it especially susceptible to the action of the cheesy fermentation. Curd derived from blue grass changes more easily and rapidly into rich, salvy, soluble cheese than that obtained from other grasses, thus rendering successful cheese-making less difficult. There are several other species of *Poa* that are pretty widely diffused, but they do not equal the *pratensis* in usefulness. P. *annua*, a low spear grass, grows everywhere in cultivated grounds, along paths, &c., as a weed, and is an annual that ripens early, and drops its seed in time to manure a second crop each season. *P. compressa*, a blue jointed wire grass, very common, and a favorite of sandy soils, is very tenacious of life, and has small, pale, hard, innutritious stems, that grow in a decumbent tuft. Fowl meadow grass (*P. serotina*), and rough meadow grass (*P. trivialis*) make excellent butter and cheese, and good meadow and pasture in moist rich soils, but lacking the hardiness of *pratensis*, they soon run out on drier ground. The hardiness of June grass is owing to its peculiar mode of growth. It does not, like the other species of *Poa*, have the division between root and stem at the surface of the ground, exposing all the green herbage to the weather. But it sends out from the parent root stems that spread in all directions below the surface, as strawberry runners and white clover do above it. These subterranean stems strike root at every joint, and throw up stems and leaves to the surface, covering it with a thick mat. They cross and recross each other in every direction, making a strong turf that tears as if formed of a web and wool. These underground stems, protected from drought and frost, ready to send up new shoots, should all the herbage above ground be destroyed by these influences, give June grass a never-dying hold on the soil, and enable it to spread and flourish where other grasses would run out. A fire may even run over the ground, and burn everything green from the surface without doing it any serious injury; for the stems below will quickly send out new shoots. Among the new plants favored with this system of underground stems are the Canada thistle, milk-weed, quack-grass, and drop seed, or, as some call it, Nimble Will (*Murlenburghia Mexicana*); hence the great difficulty in eradicating them when once fairly established. But tenacious as these pests are, June grass will crowd them out and hold sole possession of the ground. In the South, June grass, or, as it is there called, blue grass, is often propagated by sowing the seed. In the North this is very rarely done, but pasture and meadow are mainly seeded with timothy and red clover. Limited quantities of several other grass seeds are also occasionaly sown. Red clover is a perennial only under favorable conditions, and a few dry summers, and hard, open winters, soon nearly obliterate timothy. As they die out, the indigenous June grass constitutes the bulk of the pasturage, coming in, like the white clover that usually accompanies it, from nature's seed, which, after lying in the ground an indefinite time dormant, springs into active growth under favorable circumstances. When once it gets a fair footing in the soil, nothing but the plough will subdue it. Therefore it forms a leading element in all permanent pastures, and controls the quality of their products. No locality becomes distinguished for the excellence of its dairy products, especially of its cheese, until this grass becomes the principal occupant of its pastures. True, there are other grasses that will give even larger yields, but they die out too soon to give a permanent reputation to any considerable extent of country. It is this hardy blue grass, which nobody fosters, but which creeps in by stealth, that gives character to the whole dairying belt that lies across the continent from east to west, embracing a breadth of some ten to fifteen degrees of latitude."

Feeding Mowing Lands.

By Joseph N. Sturtevant.

Economy,—the second thought—
Feels the cattle by the swath.

I hear it said that farmers are saving much hay this open weather; cattle manage to pick up much in the fields. Indeed, in my riding I see, sometimes, herds of cattle in mowing fields, grazing the dry aftermath. For some days it is likely they may secure a third or half their support away from the hay mow. It seems to me, however, that for every mouthful of hay saved by this means, four or five good mouthfuls will be lost to the barn the coming summer. If of this you are doubtful, then consider the reasons in support of the assertion. It is assumed that the soil on your farm is light, thin, and rests upon a well drained subsoil.

The practice of manuring grass lands upon the sward, to keep the grass well, and save the expense of ploughing, and hazard of reseeding, has become at least a Massachusetts custom.

This custom finds its support in the belief that grass roots lie near the surface of the ground—that the rains or melting snow liquefy—so to speak—the manure applied to the surface, and in the liquid form it settles in the soil sufficiently for the surface roots of the grass to be thereby nourished. We know that the most fertile layers of our farm soils are the layers near the surface. Surface applied farm manure has its greatest strength retained in these layers. Go down three or four inches and it is found that for every half inch deeper there is less of fertility. Examine the ploughed furrow, and the great mass of roots are not found below these few inches. What lies below this depth is very important in sustaining a growth of grass, but the larger part of the stuff of which grass is made withdrawn from the soil is found above. Different is it with clover, perhaps, and other deep rooted plants, and different it may be, perhaps, with grass in a clay or deep soil.

Careful experiments show that the greater portion of liquid manure applied upon the surface does not drop through like lead in water, to the bottom, but that it is diffused through the uppermost parts of the soil. Unless then grass roots are conceded to be near the surface, topdressing of grass lands we must regard as an indifferent use of manure. But we know it produces results of value.

Accepting then these two positions, the one as to the descent of manure in the soil, and the other, as to the growth of the roots of grass, another position with respect to the nature of grass will be readily accepted. That grass, unlike some species of plants, the common English grasses, does not flourish in a dry soil, but requires water in abundance during the growing season, we think is every one's experience. In our dry soil, put in manure, and with a rainy season, there is good yield of grass. But without frequent rains upon a light soil, or some means of retaining moisture in the soil, our crop fails. To have grass in perfection demands that the farmer have a suitable soil; that the soil shall be fertile, and that it shall be kept sufficiently moist. Without the last, all efforts are unavailing. The thing of greatest difficulty is to secure water to the growing crop.

What has the feeding close of our mowing fields in autumn to do with this? Some say to feed grass close to have it meet winter in a naked condition is to have it winter killed. I fear more that it will *be summer killed.*

The field that meets the spring sun in this naked state, is the soonest green. The sun does this, the rain being abundant in the early spring. The early part of June, or towards the middle of the month, there is often the beginning of a drouth, no showers—the roots of the grass, being near the surface are soon dried—the blade slackens in growth and ripens short of a full development.

Suppose, instead of this, the fall finds a growth of, say four inches of grass—the crisp cold deadens it—the winter snow falls upon it, and when gone leaves the dried grass flattened to the earth. The spring sun is upon this cover—half an inch of loose mulching; the blade is slow to start, nor does the thirsty sun, and more thirsty winds suck up the moisture in the soil rapidly Why? There is this half inch of non-conductor of heat, of cold, of moisture between it and the soil. The land receives the rain from heaven, and drinks it in—and between summer showers there is not a rapid rendering up of the water so much required There is nothing more conducive of a retention of water in the soil than a good mulch. *Nature, when let alone, kindly provides this for grass, between the time of haying and autumnal frosts.* Does anything require a mulch more than grass.—*Mass. Ploughman.*

Implements of Husbandry.

Ploughing and Ploughs.

Why do people plough the soil, or why is ploughing at all necessary? It is well to know the theory of everything we put into practice, because then we can work intelligently and with a definite and expected object in view.

Packed soil *i. e.* soil in its natural state is unfit for proper nourishment. Wonderfully enough yet truly, nature has so ordained that air and water must play very important parts in her economy and not only afford special and essential elements in the sustenance of animal life, but also in that of the vegetable creation upon which that life depends. Caked, lumpy earth— earth which has lain undisturbed for years—is, whilst in such a state, valueless, even although it contains within it all the chemical elements necessary for nutrition. The action of the air is absolutely necessary in order to animate or vivify these elements into action and it is the action thus produced which nourishes the plant.

Water also is as necessary, either in the shape of rain or dew, as air, for, like air, it introduces into the soil either some new element or elements not already there, or it affords a superabundance—so to speak—of something already there, thus disarranging the original plan and setting the whole into action.

But this is not the only use of ploughing viz., to afford access to air and moisture. Roots must spread if the plant is to grow and become strengthened, and roots, especially in their first or tendril stages, are so weak and slender that the coast must be made perfectly open and clear for their extension or they will not spread out at all, and hence they will of course fail to draw from the soil the amount of nourishment necessary to sustain a vigorous plant. The soil therefore must be stirred up and loosened, so as to offer no obstacle to the creeping of these little fibral roots in every direction.

The benefit of ploughing land may therefore be summed up briefly as two fold, to afford access to air and moisture, and to admit of the extension of roots.

The ploughs used in Canada, which have already been pretty fully described in the "Farmer" vary in style from the commonest form of the "short stub" or rough-land implement to the finest iron-beam jointer and fancy plough. It is not a little singular also that notwithstanding this variety and the numerous tests to which all the different implements have been subjected, there is all over the country a decided leaning back towards the old No. 4, as on the whole as serviceable and durable as any of the others.

There is noticeable however, in all those who have tried them, a decided preference for some late ploughs of English and Scotch manufacture, for in both these countries in which farming has reached almost to perfection, the agricultural implements although heavy in comparison with ours, have kept pace with other improvements Of these the firm of Ransome and Sims of Ipswich, in Suffolk, furnishes some very superior ploughs. One class of these is fitted with a lever neck, and has the box of the share attached to a movable noose so that as the share wears away it can be set more to land or with more pitch, as may be desired. In another variety the share is fitted to a rigid noose, and in general these ploughs are constructed to lay furrows at an angle of 45°, in which case the width of furrow should be one half more than its depth This method of laying the work is best adapted for exposing the ground to the action of the atmosphere, and, when harrowed down, produces the best seed bed.

One of the most noted English Ploughs which has hitherto been imported into Canada, but used principally on clear, level land, is the Patent Trussed Iron Beam, which is a very fine, scientifically adjusted implement.

The handles are of just sufficient length to give perfect command over the plough.

The beam is on the patent trussed principle by which greater rigidity and strength are secured with the same weight of metal, than can be by an ordinary solid beam. The construction of the beam also permits the coulter to be placed quite centrally, so that it does not require to be 'necked,' and therefore is more easily kept in its proper position than when it it is necked, which it must always be in solid beam ploughs.

The wheels are carried on one cross bar, so that they can be more firmly fixed in any desired position, and more quickly shifted than when they are carried on two separate bars, and the whole wheel fastenings are rendered extremely simple without omitting any adjustment that can be required for either the land or furrow wheels.

The draught is taken directly from the head, for careful experiments have shown that in a properly constructed plough, the draught bar is quite needless and often very injurious, causing the plough to choke in foul land or to pitch in hard land.

The share is fixed to a wrought iron, movable lever neck, which allows it to be set with more or less pitch as may be required, and the arrangements for fixing the neck in the desired position are much simplified and very effective. The form of the share and mould-board have resulted from a series of very careful experiments on a variety of soils, so that they leave the furrow slice neatly turned over at an angle of 45° with the arras full and sharp.

The skim coulter may be set with more or less pitch at the pleasure of the ploughman. The plough can also be fitted with a mould-board and share which cuts a furrow slice of a rectangular section, the kind of ploughing considered best in England for producing crops, and turns it completely bottom upwards, thus exposing the lower strata of soil to the fertilizing action of the atmosphere, and burying all the surface vegetation so that it decomposes, becomes manure, and enriches the soil. This is the kind of ploughing usually adopted in Kent.

The same plough is likewise intended to produce a high cut or crested furrow. This sort of furrow possesses the advantage of exposing rather more surface to the atmosphere than the rectangular one, but to set against this, there is about one-ninth less land disturbed or stirred up by this plan than by the former one, in consequence of the furrow bottom being inclined to the land side instead of at right angles to it, and whatever is the depth of furrow the horses must travel two miles farther per acre than is necessary on the rectangular system.

Another rather novel implement made by the same Suffolk firm is what is known as the double plough or the "patent iron one-way, or turn-wrest plough." It is for the purpose of turning furrows in one line of direction and parallel to each other, and is invaluable for hill-side ploughing. It is simple in formation and almost self-acting in its adaptation to each successive furrow. It does not require to be turned round at the end of the field, but the ploughman, having completed his furrow to the right, turns the handle from one end of the beam to the other. Whilst performing this simple operation the horses turn round on the land side of the plough, and as soon as they commence drawing, the left hand share and coulter set properly to work. The plough is provided with two mould-boards and coulters, facing in opposite directions, is capable of turning a furrow 7x10½ inches and is strong enough for four horses.

Still another most singular plough, intended more for sub-soiling than for common ploughing, is known as the 'Archimedian.' It is intended to pulverize the soil more thoroughly than by the common method, and for this purpose it is provided with an axis so fixed in the frame of the plough that it is free to rotate on two centres.. This axis carries three steel blades upon it, so placed as to form a portion of a triple-threaded screw. The resistance of the earth at the plough is drawn forward, causes the axis to rotate by which action the blades pulverize the earth. It is used after ordinary ploughs, and at a depth of from 6 to 12 inches. It requires from two to six horses according to the nature of the soil.

Length of Whiffletrees

A horse cannot draw as well with a whiffletree twelve feet long as with one two feet six inches in length, because the line of draught is not in the proper direction to be most effective. Nor can two horses harnessed abreast, draw well with whiffletrees ten feet long, while their heads are coupled close together, because they must travel sidewise more or less, in which position no animal can exert all his strength to the best advantage in hauling a load.

Horses draw best with the double whiffletree just long enough to allow them to stand close to each other, having the single whiffletrees attached directly behind them, and just long enough to meet the middle. When the whiffletree is very long, each horse must draw more or less sidewise is the coupling lines and the neck yoke are not made long enough to allow them to move directly forward without having their heads turned toward each other.

In order to determine the correct length of whiffletrees, let two horses stand side by side, with their sides three inches apart, then measure from the centre of one horse to the other, on their backs This will give the length for a neck yoke, and the correct length for the double whiffletree between the joints where the single trees are to be attached When a neck yoke is only 18 inches long, and the double tree of the proper length, horses will be required to move more or less sidewise For the same reason oxen often get in the habit of hauling sidewise, because the yoke is too short. Neither oxen nor horses can travel easily and freely when their heads are turned toward, and their butts from, each other.

Whiffletrees for ploughing should always be as short as they can be made, without bringing the traces against the legs of the team. A very long double whiffletree tends to make a plough take too wide a furrow slice If the clevis be adjusted to take a narrow furrow slice—when the double-tree is too long—the plow will not run at all satisfactorily. The horse in the furrow will not be able to walk squarely in his place, because the line of draught is such as to keep crowding his hind feet out of the furrow on the plowed ground. The length of the double whiffletree and the neck-yoke for a sleigh should be just as long as the sleigh is wide, from the centre of one runner to the other.—*Manufacturer and Builder.*

Pat's Welcome to the Reaping Machine.

Och, I'm sick of the sickle, Molly dear,
Av stoopin' so long and so low,
And it's little sorrow it gives me
To give the ould bother the go;
And when another harvest comes,
By the powers I'd like to see
The money or anything else that 'ud make
A reaping machine of me.

WAGGONS UPON RUNNERS.—There is seldom real necessity for putting a waggon upon runners, but if an occasion occurs, as when the snow is soft and deep, the labor is not much, and the relief to the team may be very great. Two stout hickory or ash saplings are taken, smoothed upon two sides, and the points marked where the wheel will rest when placed upon them, with the buts to the front. If the buts are not placed to the front the sticks must be squared throughout the whole length. When the places for the wheels are marked, grooves may be cut for them to stand in, and the poles may be shaved down in front so as to bend. The runners are fastened to the wheels by boring holes through them and winding stout iron wire many times around the fellies and through the holes in the runners, the bent ends being fastened in the same way. Runners which are narrower in front than behind are often very hard on the team, especially so when running in frozen sled tracks.—*Agriculturist.*

Agricultural Chemistry.

Nature's Laboratory.—(Continued.)

BY DR. C. M. SMITH, OWEN SOUND.

Germination.

The series of changes which occur during the development of the seed into the perfect plant, provided with root, stem and leaf, constitute the process of germination; and from their mysterious character have for many years engaged the attention of scientific enquirers. The following remarks will apply principally to the *mealy* or *farinaceous* seeds, as these are chiefly interesting to the agriculturist. The two principal classes of seeds included in the above division are the cereals, (wheat, oats, &c.) and the leguminous seeds, (peas, &c.) The chief constituent of cereal seeds are starch, vegetable, albumen fibrine and gluten; they also contain oily matter, sugar, earthy phosphates, woody matter and water Leguminous seeds are characterized by the presence of a peculiar substance called *vegetable casein*, on account of its close relation to the casein or curd of milk. The tough mass left after washing wheaten dough with water, consists of two portions, one soluble in alcohol, the other insoluble in this liquid. the former is call *gluten*, the other *vegetable fibrine*. Vegetable casein is soluble in water, but does not coagulate or form a jelly on heating, like the substance termed vegetable albumen.

The proportions of these ingredients vary in the different kinds of cereals, and even in the same variety of seed when under different circumstances relating to climate, soil and situation. As raw gluten (fibrine and pure gluten) constitutes the most nutritious portion of these seeds, it may be interesting to lay before the reader the following table, showing the quantity contained in various grains under different circumstances. The authorities are Davy and Hermbstaedt:—

	Per cent
Wheat, Spring	19 "
" Mildewed	3·2 "
" Blighted	13 "
" N. American	22·5 "
" cultivated in soil manured with ox-blood	34·24 "
" from soil manured with human fœces	33·94 "
" from soil manured with human urine	35·1 "
" from soil manured with horse-dung	13·68 "
" from soil manured with cow-dung	11·96 "
" from soil not manured	9·2 "
Barley	6 "
Oats, from Scotland	8·7 "
Rye, from Yorkshire	10·9 "
Rice, Carolina	3·6 "
Maize	3 "
Beans, common	10·3 "
Peas	3·5 "

According to Sir H. Davy, the wheat of warm climates abounds in gluten, is harder and more difficult to grind than that of more northern countries. This property renders the wheat grown in the South of Europe more adapted for the manufacture of maccaroni, a large article of diet in Italy.

There are certain conditions necessary to the process of germination which will first be briefly stated before describing the changes which take place during its completion.

The seed must be in a state of maturity, must have been fecundated, must contain an embryo perfect in all its parts, and must not be too old. Some seeds, however, retain the germinating power for a great number of years, especially those of the leguminous class; but they must have been protected against the influence of air, light and moisture.

Water, heat and air are external agents essential to the act of germination. The water penetrates into the substance of the seed, causes the embryo to swell, softens its coverings and effects changes in the cotyledons or seed-lobes which render them capable of affording nutriment to the young plant. It also serves to convey the gaseous and solid substances required during the first stage of plant growth. This fluid, however, must not be in excess in the case of land plants, for, if so, the seed undergoes a sort of maceration and exhibits the phenomena of putrefaction rather than of germination. A certain degree of heat is always necessary during this process. A temperature not higher than from 75° F. to 85° F. favors germination, while one beyond this destroys the vital principle.

Air is also necessary to the development of the seed, as it is to the growth of animals. Everyone has known instances of seeds having been buried too deeply in the earth, and in consequence exhibiting no signs of life, but afterwards, from some cause, they have been brought nearer the surface and then germinated. Pure oxygen is too stimulating to the seed, it soon exhausts its activity as in the case of animals confined in such gas. Thus, although azote or nitrogen in itself does not support germination, it becomes necessary on account of its moderating effect on former gas.

Light, although necessary in the succeeding stages of growth, retards germination. One of the chief chemical changes during the sprouting of the seed, is the union of oxygen gas with the excess of carbon of the embryo and the expulsion of carbonic acid. This change is contrary to that taking place in the plant when provided with leaves and subjected to the action of light.

At the same time the decomposing gluten of the seed acts as a ferment on the starch, converting it into a soluble substance, namely, sugar. The same principle is artificially exemplified in the act of malting grain.

The Root.

This portion of the plant may be said to act chiefly in a mechanical mode. Still it exerts a certain power of selection over the substance brought in contact with it by means of air and moisture. The fluid containing the various ingredients necessary for the nutrition of the plant ascends through the woody layers next the pith by means of the mutual action between fluids separated by membranes, termed *exosmose* and endosmose. Thus the root of the plant may be said to be homologous to the stomach, or rather the mouth of the animal. On reaching the green parts of the plant, or those exposed to the atmosphere, it is subjected to the action of evaporation thus losing hydrogen and oxygen (water,) and to the contact of carbonic acid and nitrogen. These elements combine variously to form woody fibre, &c., which are appropriated by the stem as the elaborated fluid passes downwards through the inner layer of the bark. But, although the root cannot be said to take part directly in the formation of woody fibre, it must not be forgotten that it possesses the additional power of excretion, as for instance the various medicinal and coloring substances contained therein. Some writers have attributed a share of the ill effects of a continued succession of the same crop on a soil, to the excretions of the roots, which, although beneficial to different plants, are hurtful to the variety affording such excretion.

The Bark.

The bark or outer layer of the stem may also be said to serve more of a mechanical purpose than chemical. It protects the delicate layer of cells which convey the sap downwards through the stem. It is generally slightly developed in the vegetation of equable climates, and in animals such as our various crops.

The Leaf.

The leaf is the grand agent in effecting chemical transformation. But besides it possesses in a most perfect degree the properties of absorption and exhalation. Here the crude sap is changed into a fluid holding in solution the various ingredients necessary

for the growth of the plant and the development of the flower and fruit. As yet very little is known of the ultimate chemical combinations and decompositions which result from the action of heat, light and air, on the vital principle of the leaf.

During the formation of the flower and fruit, oxygen is absorbed and carbonic acid given off as in germination. As little is known regarding the chemical properties of the coloring matter of vegetables, this brief and necessarily imperfect description of a few of the transformations continually occurring on a magnificent scale throughout Nature is now brought to a conclusion.

Science and Agriculture.

The London *Agricultural Gazette*, in speaking of the ignorance of farmers and the comparative slow progress of improvements in agriculture since old Jethro Tull shed the first rays of science on the farmer's calling, says the scientific world is responsible for the backward state of agriculture compared with other arts, and that farmers are not altogether culpable for their ignorance of the scientific principles of their calling, since those who had the power failed to exert it for the benefit of the farmer, till the example was set by the immortal Davy. Now the writer says: 'What if farmer Dobson did think last year, that Ammonia was the name of a gentleman's daughter, he knows better this year; and next year we will hear of his putting sulphuric acid and bone-dust into his compost-heap to seize this fair lady as she flies. Why should he be expected to be a ready-made chemist? When he was a boy chemistry was scarcely born. He had no education in chemistry How should he know it had anything to do with farming? He is not to blame for his ignorance; the blame, if anywhere, lies with those who blame him, viz: the scientific world, who have allowed the physical world to grow nearly 6,000 years old, and have only just made the notable discovery that nature's science (chemistry) is eminently and necessarily applicable to the art of human subsistence (farming) I say it is the *backwardness* of science, not the *ignorance* of farmers that deserves improvement.—*Boston Cultivator.*

Strength of Small Things.

Among curious experiments recorded, are some trials of the strength of beetles A dark tube is made of card, closed with glass at one end This glass is hung on a pivot, like the swinging glass in a church window. The beetle makes for the light, and pushing to get out, lifts from four to ninety times his own weight. The smaller the creature, the greater his power. The mole, or the rabbit makes burrows in which the little ant would be lost, yet the ant's strength is relatively much greater than that of the mole. The excavating power of the latter is, however, most wonderful. We once saw a mole turned out of his track with a spade. The little creature fell upon a gravel walk, and in less time than it takes to write down the fact, the four-footed engineer was out of sight again.

An African ant-hill is thousands upon thousands of times larger than the builders The pyramid of Cheops is but ninety times the height of a man If a lion had the power of a grasshopper he could leap over a mile: and it has been asserted that if a man could leap like a flea, the misstatements of the celebrated "Moon Hoax" might be corrected by notes taken on the spot.—*Philadelphia Public Ledger.*

Carbolic Acid.

Carbolic acid is now so generally employed as a disinfecting agent, that a *resume* of the various forms in which it is made, in the largest establishment carrying on its manufacture in England (Calvert's), may prove of interest

1. Solid carbolic acid of three different qualities, the point of solidification of which varies from 81 degrees to 108 degrees Fahrenheit

2. Liquid acid of two different qualities, constituted almost entirely of cresylic acid According to Mr. Calvert, the disinfecting properties of the latter substance are those of carbolic acid

3 Soaps in which the proportion of carbolic acid varies from five to twenty per cent according to the uses to which they are to be applied

4. Disinfecting powder, composed of silex and fifteen per cent. cresylic acid The silex is obtained from alum factories, where kaolin is treated with sulphuric acid. The disinfecting acids become thoroughly incorporated with it, forming a dry and pulverulent substance.—*Scientific American.*

Horticulture.

EDITOR—D. W. BEADLE, CORRESPONDING MEMBER OF THE ROYAL HORTICULTURAL SOCIETY, ENGLAND.

THE ORCHARD.

Winter Pears.

There is progress being made in the flavor of winter-ripening pears. Our first experience with this class of pears was not at all satisfactory. They were all deficient in flavor, or so very variable in quality that no reliance could be placed upon them. It was very annoying to cut a fine showy sample of Beurre Diel or Vicar of Winkfield, expecting to enjoy an agreeable dessert, and find the flavor scarcely better than that of a raw turnip. Once or twice in a decade these, and kindred varieties, have indeed come up to the pleasant expectations entertained of them, but as a rule they have not equalled in flavor the apples of the same season.

But now we have at least two American varieties of Pear which ripen in winter and maintain in a very high degree the fine flavor of the autumn sorts. It has been the privilege of the writer to test during this month of January the quality of Dana's Hovey and Jones' Seedling Pears, and the result has been highly satisfactory. They are both fruits of high flavor and fine quality, and deserve a place in the pear orchard of every gentleman who values excellence more than size.

Dana's Hovey.

was raised by Francis Dana of Roxbury, Massachusetts. The tree grows vigorously, and seems to be possessed of a strong and hardy constitution, that will make it well adapted to a large part of the pear-growing region of Ontario The fruit is small, quite small, not larger than the Seckel, another exemplification of the adage that nature puts up her choicest productions in small parcels. And it also much resembles the Seckel in flavor, so much that we doubt not many of our readers would suppose, judging from the flavor alone, that it was a Seckel kept in some way far beyond its season.

Jones' Seedling.

originated near Philadelphia, the fruit is about medium in size, being something larger than the other variety we have named, but not quite as fine grained in its texture. Its appearance is attractive and inviting, and the flavor a very agreeable mingling of the sugary and vinous In its native place it is ranked as an October fruit, but grown here it can be kept well until the middle of January.

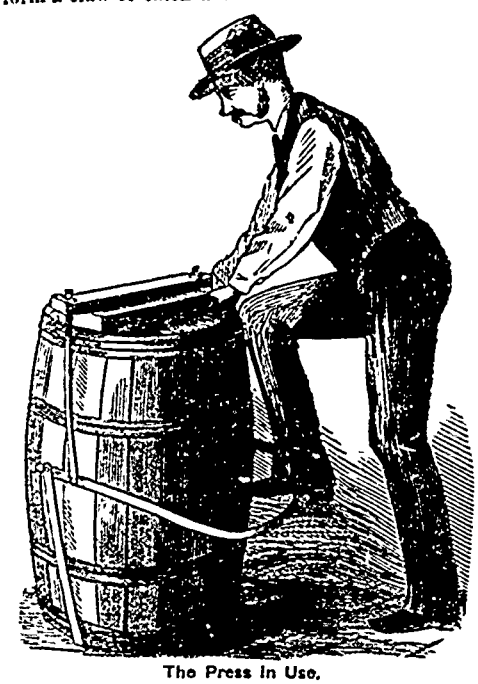
These are American varieties, and show that those who maintain that we must look to native productions for our most valuable and finest flavored fruits, are not without some substantial evidences in support of that position.

Barrelling Apples.

Visitors to Covent Garden cannot fail to have noticed that the Newton Pippins and other apples imported from America reach this country in a remarkably perfect condition. This is owing to the fact that they have been so carefully packed in the barrels, that no amount of rough usage with which they may meet during their journey, can possibly shake them loose to bruise each other For this purpose various kinds of presses are employed, worked by levers or by screws. A new contrivance of this kind has lately appeared, which combines effectiveness and simplicity to such a degree that we are induced to quote the following article on the subject from the *American Agriculturist* —

Whenever we have had anything to say about barrelling fruit, we have insisted upon the importance of so packing it that it cannot move and become bruised in transportation. When fruit is barrelled, the barrel should be so filled that a moderate pressure will be required to bring the head into its place. A few of the apples, &c., next the head may be slightly flattened upon one side, but the rest of the contents will be kept from injury. The necessary pressure is applied in various ways. The simplest is to use a joist or other stick of timber for a lever. One end of this is placed in a notch in a post, or under a cleat nailed to a post or an old tree, as a fulcrum The barrel is placed under the lever near the fulcrum, and power applied by a man pressing on the opposite end of the lever. Some blocks of wood will be needed for followers to place between the head of the barrel and the lever. A press of this kind will answer every purpose, but it is clumsy and unhandy. Several portable presses or clamps have been invented and patented, consisting essentially of a platform on which to stand the barrel; to this are fixed two upright iron rods, which are attached above to a cross-piece, in the centre of which is a screw; the barrel being placed under the screw with the necessary followers, a few turns bring the head into place. A more simple press is shown in the engravings. There are two iron rods, one end of each of which is turned to form a claw to catch under the bottom of the barrel.

Barrel Press.



The Press in Use.

The other ends of these rods are fastened to the ends of a bar that is bent at right angles, which we may call the handle of the affair There is a strong cross-head which has a short rod at each end The lower ends of these rods are also attached to the handle but a few inches distant from the ends where the other rods are attached. The working of the press will be readily understood from the engravings, the claws catch under the lower edge of the barrel, and the cross-piece, with a follower, goes across the head of the barrel; when it is put on, the handle is upright, as shown in figure 1 It will be seen that by bringing down the handle a powerful leverage is exerted, the rods, which are caught by their claws under the bottom of the barrel, acting as fulcrums. The operator regulates the pressure by his foot, while the hands are free to fasten in the head, as shown in figure 2. This press has the advantage of being light, all in one piece, and doing its work with a single motion.—*The Garden.*

A Disease-Destroying Tree.

M. Gimbert, who has been long engaged in collecting evidence concerning the Australian tree *Eucalyptus globulus* the growth of which is surprisingly rapid, attaining besides gigantic dimensions, has addressed an interesting communication to the Academy of Sciences. This plant, it now appears, possesses an extraordinary power of destroying miasmatic influence in fever-stricken districts. It has the singular property of absorbing ten times its weight of water from the soil, and of emitting antiseptic camphorous effluvia. When sown in marshy ground it will dry it up in a very short time. The English were the first to try it at the Cape, and within two or three years they completely changed the climatic condition of the unhealthy parts of the colony. A few years later its plantation was undertaking on a large scale in various parts of Algeria. At Pardock, twenty miles from Algeria, a farm situated on the banks of the Hamyze was noted for its extremely pestilential air. In the spring of 1867, about 13,000 of the eucalyptus were planted there. In July of the same year—the time when the fever season used to set in—not a single case occurred; yet the trees were not more than 9ft. high. Since then a complete immunity from fever has been maintained. In the neighborhood of Constantine the farm of Ben Machydlin was equally in bad repute. It was covered with marshes both in winter and summer. In five years the whole ground was dried up by 14,000 of these trees, and farmers and children enjoy excellent health. At the factory of the Gue de Constantine, in three years a plantation of *Eucalyptus* has transformed twelve acres of marshy soil into a magnificent park, whence fever has completely disappeared. In the island of Cuba this and all other paludal diseases are fast disappearing from all the unhealthy districts where this tree has been introduced. A station-house at one of the ends of a railway viaduct in the Department of the Var was so pestilential that the officials could not be kept there longer than a year. Forty of these trees were planted, and it is now as healthy as any other place on the line. We have no information as to whether this beneficent tree will grow in other than hot climates. We hope that experiments will be made to determine this point.—*Medical Times and Gazette.*

Dr. Hull's New Curculio Catcher.

At the meeting of the Alton Horticultural Society, which celebrated the national holiday by a meeting on Dr. Hull's premises, we had an opportunity of witnessing the operation of this new machine, a patent for which has already been applied for. The general shape of the frame is much the same as that of the wheel-barrow machine, illustrations of which have already been published in the American Entomologist, and in the transactions of the Illinois State Horticultural Society. But the new machine instead of being mounted on a wheelbarrow is suspended from the shoulders of a man standing in its centre. A slit a foot wide in the canvass before him enables him to carry the machine under and about the tree, when the slit is covered by a strip of cotton easily and quickly, and the tree struck with a covered mallet or maul. The machine weighs only 8 or 10 pounds, and the operation is rapidly performed. Dr. Hull tells us he has been able to go over 960 of his younger trees, now three years planted, in 3½ hours; which is at the rate of nearly 275 per hour. In this case the ground is clean, and the trunks clear to a considerable height, which facilitates rapidity of work; but (and this seems to us a special advantage of this machine,) almost any tree, however low-headed, can be got under and its insects caught.

We regard this, after the brief examination made, as far in advance of any of the methods yet devised for catching the curculio Combined with the Ransom process, it ought to give at moderate expense, almost entire exemption from the ravages of the insect The work can, we think, be done more rapidly, easily and thoroughly, than ever before; and will do more to get more persons engaged in "bug-catching," than any invention yet made.

The curculio we regard as near his downfall. His *mene tekel upharsin* we reckon as written. In the no distant future we shall expect Moorparks, Elruges and Green Gages to abound, and the Hull lot of Ransomed peach growers to pack no worm eaten fruit. Their peaches, like Dr. Homes' millennial berries, shall "grow bigger downward through the box," and there shall be no controversy as to what bird eats the curculio.—*Prairie Farmer.*

THE FRUIT GARDEN.

Fruits, and Their Value as Food.

The following table of the "Composition of Fruits," is condensed from a list of fifty-one analyses. The fruits are arranged on the table according to the percentage of soluble matter. This, other things being equal, is a fair measure of their comparative values for food. The percentage of water does not show this value so well, because of the great difference in the percentages of insoluble matters This latter item consists chiefly of seeds and skins, with a small quantity of insoluble cellulose and pectose, the latter rarely amounting to one fifth. The sugar in the first column includes both saccharose, or "cane sugar," and fructose, or "fruit sugar" The acid in the second column is expressed as hydrated malic acid —

Composition of Fruits.

Kinds of Fruits.	Soluble Matters. Sugar	Free Acid.	Albumenoids.	Pectin, Bodies, Gum and Organic Acids in Combination	Soluble Ash Ingredients.	Total Soluble Matters.	Insoluble Matters.	Water.
Apples	6·40	·62	·48	7·04	·29	14·83	3·13	82·04
Apples, another variety	7·58	1·04	·22	2·72	·44	12·00	2·96	85·04
Grapes	12·18	·91	·75	·36	·37	14·57	3·03	82·40
Cherries	10·29	·79	·64	1·83	·65	14·49	6·01	79·50
Pears sweet red	7·47	·04	·25	3·84	·28	11·88	4·63	83·49
Pears large Holland	1·57	·67	·62	8·30	·67	11·83	7·40	80·77
Apricots	1·34	·84	·61	7·60	·78	11·17	5·34	83·48
Gooseberries	7·12	1·43	·42	1·18	·38	10·53	3·42	86·21
Currants	6·38	2·15	·50	·15	·59	9·77	5·42	84·81
Strawberries	7·57	1·13	·36	·12	·48	9·67	2·86	87·47
Whortleberries	5·78	1·34	·79	·56	·86	9·33	13·12	77·55
Plums, blue and black	2·13	1·30	·45	4·08	·52	8·48	4·52	87·00
Raspberries, garden	4·20	1·23	·60	1·58	·43	8·05	4·58	87·37
Blackberries	4·41	1·19	·57	1·44	·41	8·00	5·59	86·41
Raspberries, wild	3·60	1·98	·55	1·11	·27	7·51	8·64	83·86
Strawberries, wild	3·90	1·49	·59	·10	·67	6·75	6·10	87·15

The above shows how inaccurate is the common notion about fruits. It also shows that the proportion of solids is much larger than it is generally stated in many works on food. The improvement in the nutritive value of fruits effected by cultivation is strikingly seen on comparing the composition of the garden strawberries and raspberries with that of the wild varieties. The increase of the soluble or easily digestible matters is very considerable, amounting in the case of the strawberry to nearly fifty per cent. In the case of the raspberry, the insoluble matters have diminished nearly one-half in the cultivated variety. Judged by the old standard of the amounts of nitrogenous or so-called flesh-forming constituents, fruits occupy a very low position indeed. But, according to the view now entertained by our best chemists and physiologists, that the true measure of nutritive value is the force or potential energy of the substance, fruits occupy relatively a much higher position. Dr. Frankland gives a table showing the actual energies developed by various foods when oxidized in the body. A sample of apples containing the same proportion of solids as the first one given in the foregoing table, bore the following relation to other foods, taking one pound of wheat flour as a standard :—

	lbs.	oz.		lbs.	oz.
Flour	1	0	Bread	1	12¼
Apples	5	15½	Potatoes	3	12¼
Veal, lean	3	4½	Milk	6	1¼
Beef, lean	2	11	White of eggs	6	10½
Ground Rice	1	0¾	Carrots	7	6¾
Hard boiled eggs	1	11	Cabbages	9	3¼

Grapes would probably average about 5 lbs. 2 oz., and the other fruits in proportion to their quantity of solid matters. It must always, however, be borne in mind that all comparisons of the nutritive value of foods are only reliable in so far as the foods compared are equally digestible. Of invalids it may be said that what is food to one is poison to another, and with them each case has a law to itself. With persons in ordinary health the results are more uniform, but, unfortunately, we know very little concerning the relative digestibility of foods. Experiment has, however, shown that nearly one-half of our daily food escapes complete digestion and assimilation. In the light of this fact the fruits occupy a very favorable position, the great majority of them showing a high proportion of soluble matters. This, in the more common fruits, ranges from two-thirds to five-sixths of the total solids, and gives them much more nutritive value than the figures indicate. This also partly explains the value to invalids of such fruits as grapes and strawberries, which contain relatively but a small proportion of insoluble matters. Since, then, fruits are highly nutritious, it is evident that they should be used as foods. From a false idea of their nature, they have too frequently been used as drinks, and taken at improper times. They have, in consequence, received a bad name, and anxious mothers warn their children against fruit; but let them take extract of beef, or any other concentrated flesh food, and the same ailments begin to show themselves, and in forms more dangerous than ever, followed the use of ripe fruit at equally unseasonable hours. Fruit should be used as part of a meal. With children and healthy adults, just before breakfast and dinner are the best times. Invalids will find it safer, especially with juicy fruits, to take it about the middle of the meal, other dishes preceding and succeeding it. This refers chiefly to uncooked fruit. When cooked and served hot, fruit may be safely taken at any period of the meal. Invalids will also generally find the more acid fruits less digestible, and especially so when preceded in the same meal by potatoes. Fruits, especially when not quite ripe, are generally rendered more digestible by cooking. Stewing is the general, and a good method, but roasting is preferable. This may be done in an oven, or before an open fire. Cooked in this manner, fruit will generally be found to require little or no sugar, a decided advantage with invalids.

Unripe fruits should not be eaten, many of the acids found in the green fruits being poisonous. We do not know of any analysis of green fruits; but the following table shows the changes in pears from ripeness to mellowness, and finally to decay :—

	Ripe and Fresh.	Kept till Mellow.	Kept till Brown.
Resinous coloring matter	0·08	0·01	0·04
Sugar	6·45	11·52	8·77
Gum	3·17	2·07	2·62
Lignine	3·80	2·19	1·85
Albumine	0·08	0·21	0·23
Metapectic Acid	0·11	0·08	0·61
Lime	0·03	0·04	....
Water	86·28	83·88	62·72
	100.00	100·00	76·84

It will be noticed that as the pear mellows, the sugar increases in amount, chiefly at the expense of the gum and indigestible lignine. The rotting pear again shows a decrease in all the more important constituents; the sugar has in part fermented, and gone off as carbonic acid and moisture, there being a loss in weight of about 23 per cent. A sour acid of decay, called metapectic acid, has also been generated. Much more of interest might be added; but enough has been said to show that fruits should be accorded a higher value as wholesome foods than has usually been conceded to them. Those who are fond of fruit will be gratified to be assured that it is not only delicious to the palate, but rich in positive nutriment. —*Journal of Chemistry.*

Rose Slug.—I saw a question in the last *Cabinet*, asking a preventive or cure for the troublesome rose slug. I do not know what will prevent or cure them, but I do know what will kill them. Get white hellebore one ounce, and dissolve in a pailful of soft, cold water, the colder the better. Take it on a sunny morning after the dew is entirely dried off, put the mixture in a watering pot and give the bushes a good showering, throwing it up under the leaves as much as possible wetting them all over thoroughly. It will not harm the bushes or roses in the least. But I assure you, the worm that gets his share of the dose will eat rose leaves no more forever. Please tell the ladies of this that they may save those beautiful roses.—Mrs. H. F. Wood, *in Floral Cabinet.*

Fruit Garden.—Many persons think that if they have one variety of each kind of fruit that is enough. This is a mistake, and one who thus plants will not experience half the pleasure which comes from selecting a proper proportion of early and late sorts. Blackberries and raspberries can be enjoyed for some weeks longer, if both early and late varieties are set out. Winter is the proper time to lay out this work, and by carefully reading and comparing the statements of the best authorities, one can, with a proper soil, plant with good prospects of success. There are many works upon the different small fruits, and all contain something of interest as well as value to the fruit-raiser. Trees which have been trained as cordons, ought to be safe from cattle, and in the case of apricots and peaches will be all the better if a little protection is given during the winter. Grapevines may be pruned at any time when the weather is not too cold. At the south the work of preparing the soil, and in some places planting can be carried on; but at the north little outside work can be done at this season of the year.—*American Agriculturist.*

THE FLOWER GARDEN.

Preserving Dahlia Roots in Winter.

Dahlia roots are often injured by the first freezing weather, and for several years past, before the frost had destroyed the foliage, I have covered them with a layer of fresh soil or well decayed chips to the depth of 4 or 6 inches, close to the stock. They can then be safely left in the ground for two or three weeks. As an instance of the benefits of this precaution, I will mention that three years since, during my absence from home on a journey, the first frost was accompanied by a severe storm of hail and snow, the ground freezing in a night quite hard. Reports of the ruin of many potatoes not gathered prepared me to anticipate the loss of my twenty varieties of choice Dahlias; but on my return what was my surprise to find them all uninjured, and they were in fine condition the following spring, while those in neighboring gardens were destroyed.

When the roots receive their extra covering, each variety of Dahlias is carefully labelled with short strips of smooth wood, from which the name, plainly marked with a black lead pencil, is not easily erased. If brushed over with linseed oil, they are still more durable. Ink soaks into the wood, and paper labels become illegible from exposure to dampness.

On a fine day, if possible, the roots are taken up without bruising them, all the dirt is removed, and they are placed in the shade to dry a little, though not so as to shrivel much, as they grow more readily in the spring if plump, like a good potato. The tops are cut off, leaving about 4 inches of the stalk, to which the labels are securely fastened with fine copper wire or with the strands of an old bonnet wire.

I have tried several ways of storing Dahlias, both in the cellar and out of it, and prefer to pack them in boxes in the cellar, covering both tubers and stalks with sand thoroughly dried either under the hot-bed sash or in the kitchen oven. If one has only a few roots, sufficient sand can be dried in pans in the oven, but several bushels of them would require a large quantity, which is not always at hand. I have sometimes had them keep nicely when taken directly from the garden to the top of the potato bin, if rats and mice did not discover them, and then dry as usual quite well in strong paper bags hung near the centre of a dry cellar, and also in a cool upper room where there is no danger from frost.

Several times during the winter all the roots not packed in sand are examined, and if the least mould appears it is removed, and they are well dried near the fire before they are again restored to their winter quarters. These details may seem tedious to those not interested in floriculture, and it is some trouble to have things rare and beautiful in house or garden, but any real lover of Dahlias would be amply rewarded for a little extra labor and care by the possession of such perfect ones as were in full bloom in our garden on the 25th day of October.—*R. L. in the Farmer.*

Roses—Making all Right for the Winter.

The clever and humorous author of the very clever and most readable "Bo[illegible] R[illegible]s," writing to *The Garden* last week, [illegible] priety of not relying too [illegible] on the present mildness of the weather, but to [illegible] and have their pets made tidy and co[illegible] for any contingency of w[illegible] he gives in his own p[illegible]le, [illegible] fashion :—"As the tr[illegible] and attends to the c[illegible] not only in these [illegible] for his amusement b[illegible] occasional peep at his g[illegible] months (for the true sp[illegible] doves) in their green b[illegible] never forgets nor neglects his rose trees. Now, [illegible] December you will find his [illegible] planted, or in an exposed posit[illegible] securely tied to their stakes, and such [illegible] made an ex[illegible] that the wind may have less power upon the trees. Around their stems, and around [illegible] is a liberal stratum of manure. [illegible] Lovet likes an overcoat in winter, Charles Lefebvre a pair of worsted stockings, Madame Lacharme her sealskin, and Countess of Oxford her foot-warmer, quite as much as you do, and that fragile little novelty and that delicate tea must have respirators, if they are to live till spring."

Worms may be effectually driven out of flower pots by ammonia-water used to water the plants once a week—an ounce of ammonia in a gallon of warm water.

Flowers in New York.—In all our larger cities flowers form a large source of revenue to florists who make bouquets, etc., a specialty. In New York the aggregate sum spent yearly on flowers is immense. Upon funeral flowers, especially, large sums are expended. The following will show the prices paid for leading sorts in winter. The price for a handsome basket is from five to fifty dollars. Bouquets can be made at from three to twenty-five dollars. Single rosebuds cost twenty-five cents, and carnations twenty cents. Smilax is sold at one dollar a yard, and violets by the dozen at twelve cents. One spray of lily of the valley costs twenty-five cents.—*Floral Cabinet.*

THE VEGETABLE GARDEN.

Plan for Making and Working a Hotbed.

The simplest good frame, and one which we have always used for ordinary purposes, even in market gardening, is one made of one and one-half inch pine, or hemlock, free from loose knots, or cracks, for the back and front, and one inch stuff for the ends. For the posts, two by four scantlings, one and a-half feet long for the back, and one foot long for the front, will be sufficient. It will require six of these posts for each frame, one for each corner, and one for each centre.

A piece of level ground should be selected, upon which to lay the posts. Upon these place the board for the rear of the bed, the posts to come about an inch below the top of the board, or so low that the sash will not strike the back or front in sliding up or down. Nail securely, and proceed in the same manner with the front, leaving the posts a little longer at the bottom than the width of the boards ; now nail on the ends, being careful that the proper inclination is retained from the front to rear, say about an inch to the foot, so that the glass, when placed on the frame, may carry off the water. Be careful also that the end boards are high enough above the back and front to cover the thickness of the sash, whatever that may be.

Now take three inch strips, one inch thick, corresponding in length to the outside width of your bed, upon these nail strips seven-eighths of an inch thick, and wide enough to correspond to the thickness of your sash, which should be nailed on from the bottom of the three inch strips into the narrow ones. Now let these strips into the frame at suitable intervals, for the sash to slide easily, and so that the sash will at the same time make a good joint at the front and rear. You now have a frame that is at once light, strong and durable, and that will, with care, last for years.

Market gardeners often use sashes six feet in length, but for the kitchen garden we should prefer the sash five feet eight inches long, to contain four rows of 8 by 6 glass, or, the strips to be eight inches apart. The object of using 8 by 6 glass is that, when one is broken, it is more cheaply repaired. The sash should be made of the best two-inch pine, without [illegible] bars, the glass being lapped one upon the other [illegible] the bottom, well bedded in putty, firmly fastened with glazier's points, and carefully puttied. The object of making the sash of thick stuff is that [illegible] need not be more than two and a-[illegible] thus securing a large amount of [illegible] of the division strips should be about one inch. The lower portion of the sash frame should be made thinner, so that the water will [illegible], but pass directly off from the [illegible] is a good number for a frame.

[illegible] purposes, the latter part of February [illegible] to prepare your bed. For [illegible] manure from the horse-stable, that [illegible], long and short together, and [illegible] convenient to the place where you are [illegible] sufficient quantity, so that [illegible] and made pretty solid, it [illegible] inches thick. When it is [illegible], turn it on some still day, [illegible] long and short together, and [illegible] to heat strongly. If it [illegible] very hot, turn it again, to get the rank heat out [illegible] ready to place in the bed.

If your s[illegible] dry, you may excavate [illegible] the depth the manure is to be, throwing the earth out at the back and front for banking. Into this pit cast the manure, take extreme care to spread evenly, and do not allow any hard lumps to accumulate ; for if your bed does not settle perfectly even, you will have trouble in the management. Beat the whole mass firm, from time to time, with the back of the fork, and cast the fine manure left, evenly over the whole surface at finishing. Throw on two or three inches of clean earth, free from seeds of weeds, put on the frame, bank up carefully at the top, place on the sash, cover securely from dogs, etc., and wait for the heat to again rise.

If the heat should be severe, holes must be made down into the manure to let off the excess, but, if properly made, the heat in the soil will be a gentle glow when the finger is inserted. This being the case, put additional clean earth (a compost of one-half sand, one fourth good loam, and one-fourth thoroughly decomposed manure is the best), to the depth of fully six inches, raking all smooth, and the bed is ready for planting.

If the thermometer remain stationary in the bed, at about 85°, you will have hit the point very nicely, and may plant tomatoes, egg-plant, cabbage, cauliflower, celery, etc., as soon thereafter as you please. —*Western Rural.*

Ridging the Garden.

The ridge system is practiced here to some extent, and with success. First, clear your garden of all refuse matter ; then throw the ground in ridges with the plough. Draw a furrow where the centre of the ridge is to be ; throw back this furrow with the plough, and the ground below it ; then add a furrow on each side. You thus get all the ground of the ridges loosened. Continue the process through the whole garden. Finish off by drawing up the ground remaining between the ridges with the hoe, having the space between deep enough to lay bare the raw soil, so that the frost and air can act directly upon it. Now cover the ridges with manure. This, of course, is to be short, well rotted manure, and should be free from foul seed. Stable manure, if it has had the summer to decompose it, will answer as a general fertilizer. Where a special one is known to be required, this, of course, is to be supplied. Your garden may now rest till spring, when the frost and the manure will have done their work. You will find the ground a pleasure to work in—rich, fresh, and mellow—very loose, and easily worked. Replace the soil. This can more readily be done, the most of it, with the plough, though it probably pays best with the hoe, as the manure and the soil saturated with it can be better mixed, and will be more thoroughly fined. The best gardens are certainly made in this way.—F. G., in *Country Gentleman.*

Rough Plate Glass.

Some twenty years ago there was much discussion about rough plate glass, and a strong impression remained on my mind that anyone wanting to excel as a cultivator ought to use it for any of his structures. Now, six years ago, I erected a span-roofed house half-way sunk in the ground, 30 feet long, 8 feet wide, and 8 feet high in the middle. The house was heated by a common brick flue, and perfect ventilation was a principal point in the structure. The door of the house being too low to bring the plants near the glass, I could by no means induce them to grow nicely, and, when the dull days of November came, such a quantity of Fungi sprung up that I could not master them. The plants were pindling too, and more leaves than usual decayed. I then removed the rough plate glass and replaced it with good sheet glass, which made an obvious change in the health of the plants ; so much so that I will never use rough plate glass again. No doubt this glass is useful for large houses, conservatories, glass walls &c., but I think it is not satisfactory for general purposes. —*Max Leichtlin, in the Garden.*

Potato Experiment.—A correspondent of the *Western Farmer* writes : Last spring, while planting my potato patch, I took the trouble to pare a well sized tuber, in a manner more thorough than is usual for a housewife—in fact, I cut the eyes out to the very "roots," and then gave it a hill by itself. In another adjoining hill I deposited the parings of the same, and went on with my work. When the rows began to show life, and greenness, these also sent up their representatives, and throughout the whole season kept up a good appearance. The peeled potato grew more vigorously than its respective covering in the neighboring hill, and seemed more hearty in every way. When digging came, the edible portion remunerated me for my labors, as compared with its paring, in the ratio of four to one—while both together did not reach the average of the surrounding hills.

Veterinary Department.

Firing and Blistering Horses.

(Veterinary Editor CANADA FARMER.*)*

SIR:—I lately observed a notice in the *Turf Field and Farm* of a communication received from a gentleman in Montreal describing the condition of his horses, and also stating that one of them has been fired and blistered, and he says not from necessity but as a means of prevention. We should like to know your opinion of the necessity of firing in such cases.

CONSTANT READER.

[NOTE BY VET. ED.:—The firing iron is frequently used as a counter-irritant in the treatment of injury and disease of the limbs of the horse, and whilst admitting its efficacy in some diseases of the joints as Ringbone, Spavin &c., it is our decided opinion that many horses are subjected to the severe process of firing when there is no necessity whatever for the operation, therefore we cannot too strongly condemn the practice of firing in many instances. In the case Constant Reader refers to, if a severe counter-irritant was not requisite, it appears to us as a piece of cruelty to subject a fine animal to a severe and unnecessary operation; and as to its being useful as a preventive of future lameness, in our own opinion the idea is most absurd.]

Tympanites or Hoven in Cattle.

During the winter months, a tympanic condition of the paunch and bowels is by no means uncommon amongst cattle in this country, and is generally caused by the eating of partially frozen turnips, carrots or potatoes.

In the healthy discharge of the functions of the rumen or paunch, the food appears simply to undergo a process of softening, or maceration; but when the functions of the organ is interfered with, either by prolonged retention of its contents, or the injurious nature of the food taken in, the process of fermentation takes place, and gases are extricated, causing unnatural distension of the parts.

'mongst cows kept in cities, we find a very common cause of tympanites in the refuse of the kitchen, such as potato parings, apples, &c., which, in many cases, are mixed up with cold bran, and given to cows in large quantities, which prove very difficult to digest, and when retained in the stomach, it soon begins to ferment. The symptoms of hoven necessarily vary somewh. according to the amount of gases generated. Amongst the first noticeable symptoms are dullness, and more or less swelling of the left side of the belly. The animal stands with the head extended, and frequently moaning. The breathing is also labored and severe, produced by the rumen pressing upon the diaphragm and interfering with the action of the lungs. In acute and severe cases the swelling of the flank increases, until it stands prominent above the spine; if it is struck, a drum-like sound is emitted, showing plainly that the distension is due to the evolution of gas. As the disease increases, the breathing becomes still more oppressed; the animal froths at the mouth, and the eyes are unnaturally prominent, the circulation of the blood is weakened, the sufferer appears to experience very great agony, and if no relief is afforded, death soon ensues, either from rupture of the rumen, or diaphragm, or from asphyxia, produced from the enormous distension.

In order to save the life of the animal, some means must be immediately resorted to, to liberate the gas, or otherwise get rid of it, and for this purpose many different medicines are recommended. A very good drench for tympanites is two ounces of turpentine with a pint of linseed oil, or sulphuric ether two ounces, cold water one pint. The chloride of lime is also a very good remedy, and tends to neutralize the gas, and some of the preparations of ammonia have also the same effect. In very severe cases, relief must be afforded mechanically, either by introducing the hollow probang down the œsophagus into the paunch, or puncturing with the trochar and canular. In performing the operation of puncturing the paunch, the place selected for operating is a spot equidistant between the last rib, point of the haunch, and about eight inches below the transverse process of the lumbar vertebræ. A small incision should first be made through the skin, and then the point of the trochar is placed in the wound and pushed into the paunch, then withdraw the trochar, and the gas freely escapes through the canular.

After operating it is generally found advisable to administer a purgative, as a pint or two of linseed oil, or half a pound of epsom salts dissolved in two quarts of water.

Different Systems of Horse-Breaking.

The London *New Quarterly Magazine* has an interesting article on the English and other systems of breaking horses, from which we make an extract:

In foreign countries when the colt is first broken, a bit of severity greater than that in common use is put into his mouth. The rough rider gets upon his back, and something like the following scene occurs. The young horse, feeling a strange weight upon him, probably begins by leaping up with all feet from the ground, at the same time curving his back,—a proceeding known as "buck-jumping," finding that this does not dislodge his rider, he lowers his head and kicks violently, hoping to send the rider over his head The latter instantly draws the bridle tight and throws the horse's head so high that kicking is impossible to him—for to be able to kick, a horse has to hold his head low. Baffled again, he rears, and the man instantly loosens the reins and applies the spurs sharply The horse drops to his forefeet and, as a last resource to escape from his tormentor, runs away. He is pulled up by the action of the powerful bit, which holds his jaw like a vice so long as he tries to resist it; but he does not try for long, for such a bit as is used is in truth, irresistible. Then completely at his wit's end, the poor beast stands trembling, quite cowed, and breaking out in a profuse perspiration. Thereupon, the rider coaxes him and pats him and (to use an expressive word I once heard from the late Mr Rarey, of horse-taming celebrity) "gentles" him.

The horse may be supposed to argue that there is no contending against a power and an intelligence which he has learned to perceive is superior to his own. He has discovered that further contention is useless; whatever attempt at resistance or aggression he has made has been checked and mastered, and he submits. The horse is broken. Now, this is the whole principle and science of horse breaking; a very obvious principle and a very easy science. It consists only in letting the horse feel that he is completely mastered. To do this without fuss, and without unnecessarily frightening, hurting or exasperating the horse, is scientific horse-breaking.

Let us now examine the process of horse-breaking as performed in England, and see how these various conditions are fulfilled. The rough rider, armed with a stout ash sapling and a heavy pair of spurs, mounts the unbroken colt, who is bitted with the ordinary English double bridle. The colt kicks, and his bit is jerked violently and he is spurred and violently struck with the stick. He plunges and is again corrected. He rears; and here comes into action the well-known artifice of the English horse-breaker,—a feat which it takes a marvellously quick hand and perfect nerve to accomplish without danger. When the horse is standing high in the air, he is pulled over by the rider and falls backward, the rider slipping to one side to avoid being crushed. The risk to the horse is great, the risk to the driver immense; and it may be doubted whether, after all, the habit of rearing is ever cured by this heroic method.

Should the colt run away—and almost every previously untrained horse attempts to do so—the shortcomings of the English system are conspicuous Unless the horse's mouth is unusually tender, the English bit is incapable of holding him; the man puts out his strength, the horse exerts his and often gets the best of the struggle and gallops long and far. Whether he is eventually mastered or not, the horse has perceived that the rider's superiority is not incontestable, and he acquires in future a habit of resisting whenever he is frightened or irritated, and often merely from high spirit he gets into a habit of bolting. His mouth in the meantime has become callous; in other words, he comes to be hard-mouthed; for the final victory of the English breaker is rarely obtained without an immense amount of jagging and jerking and pulling of the bit The horse is essentially a creature of habit; he associates being ridden with fighting against the bit in his mouth. If he could have been persuaded at first and at once that resistance was useless, he would have given in and acquired a habit of submission.

Modes of Killing Animals.

Dr. Slade, Prof. of Veterinary Science at Bussey Institute, Harvard College, recently read a paper before the Massachusetts Board of Agriculture, upon the subject, from which we extract what follows:—

"Dr. Slade spoke on the subject of killing domestic animals, both for food and to relieve them of the burden of life, in case of disease or old age. Animals for food are killed in several different ways:—by striking a blow on the head that stuns the animal, followed by immediate bleeding; by driving a sharp needle or thin knife through the neck, severing the spinal cord, called pithing; by cutting the throat, as practiced by the Jews. Many experiments have been made to determine the most humane method of taking life, and to learn what is death, and when it occurs.

"Severing the head from the body with a knife, as by the guillotine, does not cause instant death.—The body has two motions, those which are voluntary, and those which are involuntary. Bodily motions are not sure indications of pain. There may be pain without motion, and motion without pain. To constitute pain, the brain must be in connection with the body injured. Piercing the nervous center in the neck, just back of the head, is supposed to cause instant death, but the spot to be aimed at is small and liable to be missed, except by experts. Probably the best method of killing is to strike a stunning blow on the head, and then bleed immediately, by cutting the arteries and veins connecting the heart with the head. The brain in animals is smaller than most people suppose, and is situated higher up. It is a common mistake to strike too low down on the face, causing severe pain without killing. It is best to blindfold animals before attempting to strike. To find the spot on the head of a horse, draw a line across the head through the pits above the eyes. A blow, or better, a pistol ball, in the centre of this line will kill instantly. It is advisable to dig the grave for a horse with one end on an inclined plane, that he may be led in. Then, when shot, he will fall to the bottom, thus saving much labor in moving and placing in position.

"The doctor did not recommend the general use of chloroform for killing large, strong animals. He believed the sensation of suffocation is often more cruel than killing by a blow. Cattle should also be blindfolded, and the blow should fall about one and a half inches below the horns, in the centre of the head. The tendency is to strike too low on the ox as well as the horse. The same may be said of the hog. This animal shou'd be struck three or four inches above the eyes. The line on sheep and calves is about one and a half inches above the eyes. It is generally believed that swine should not be stunned before bleeding. The lecturer said he thought this a mistaken idea, as they would bleed equally as well as if bled without first stunning One of the most sickening sounds ever heard on the farm is that from the hog, during its last struggles, and there is no good reason why the present custom should be continued.

"There is perhaps no better method of disposing of kittens than by drowning. Dogs may be instantly killed by shooting above the ears, at the side of the head.

"When dressing poultry, do not cut off their heads and throw them down to kick and flutter on the ground. It does not have a good moral influence on the young people of the household. Better strike a hard blow on the head, and bleed, the same as other animals. Fishes for food should be killed, and not left to die. The food is much more wholesome, and keeps longer, besides being harder and sweeter.—There is no reason why fishes should be excepted from the general rule that animal food should be bled. It is also very inhuman to let a fish die by slow degrees, out of its natural elements."—*Rural New-Yorker.*

Clipping Horses.

The practice of shearing horses is quite popular in some of the European cities, and it is not entirely without followers in this country, and even in Chicago It is done in the fall and winter, in order to produce the same appearance in winter as the short, natural summer coat gives to the carriage and driving horse in the warm season; and is claimed to exercise a favorable influence on the health of the animal, giving tone to the system, and bracing up the constitution generally.

We are not sure that the operation in connection with the treatment which such horses generally receive can be defended on the score of either beauty or utility. It is a violent, unnatural operation, to rob a horse in November of the protection which nature provided for him in the hair of his body against the rigor of winter in this latitude. That it may be done without serious detriment is conceded, but that one driving horse in ten is so carefully handled as to avoid serious danger to his health by exposure under such circumstances, is doubted; and in a large majority of cases, it becomes simply a barbarous outrage upon the health and life of our most valuable speechless servant. Spans of stylish carriage horses may be seen frequently before our fashionable dry goods stores, waiting for their mistresses to finish shopping, shivering in the breeze—the mercury down about zero—the driver too ignorant or too lazy even to throw a blanket over their closely shorn forms. That pneumonia or some other fearful acute disease does and must follow every such brutal exposure, is a reasonable certainty. So much for the utility. In regard to beauty. Few persons who really love a fine horse, and truly admire his qualities, fail to find pleasure in the soft, silky coat of a high-bred, well groomed horse in winter. It is a feature which every horseman expects and values.

We have taken some pains to ascertain who are the advocates of this practice, and find they may be classed about as follows: First, a few gentlemen who know very little of the danger which attends it, and who are really pleased with the change it makes in the appearance of the animal. Second, a few self-dubbed veterinary surgeons, who having been hangers-on in foreign stables, have come to this "blarsted country" full-fledged "horse doctors," anxious for practice. But third and chiefly, a lot of lazy, presuming, ignorant grooms, who are not willing to rub dry the natural winter coat of a horse after he comes in from exercise. It takes fifteen minutes longer, and a good deal more honest work, to groom the latter well, than it does to dry out the former. No consideration of comfort or health to the dumb brute, or of the interest of the owner, enters into their calculations. The long hair once wet with perspiration, must be thoroughly rubbed, or it will tell the tale of neglect until it is, but a few passes of the cloth suffice to cover up all such evidence on the other. The clothing is thrown on almost immediately on the arrival of the latter at the stable, and the work is done.

It is sincerely hoped that this practice will not become "fashionable," but should it be otherwise, we may look for a frightful increase of lung diseases among horses subjected to it—a harvest of employment for the doctors, and a harvest of death to their unprotesting victims.—*Prairie Farmer.*

SWELLING OF LEGS.—When the legs of a horse swell upon standing in the stable it is an evidence of debility, general or local It would be well to increase the food in quantity or quality. The following might also be of use—viz.: Powdered sulphate of iron, one and one-half ounces, gentian root, two ounces; chlorate of potassa, one ounce, mixed and divided into twelve powders. One of those given in cut feed as little moistened as possible night and morning. Ground oats would be better for feed than corn. Friction by rubbing with a coarse woollen upon the parts would also be helpful.—*American Agriculturist.*

GUTTA PERCHA FILLING FOR HORSES' FEET.—Gutta percha has proved the best thing yet discovered to keep horses from balling with snow, and preventing accidents. The kind that is sold in thin, wide strips is considered the best. It takes about a pound and a half to fill the fore feet of a horse, and it costs $2 a pound. When a horse's feet are stuffed with gutta percha it gives him a good foothold, and he lifts his feet free from snow. Melt the article in warm water, and then stuff the foot. This can be taken out and put back every day during the winter if necessary.—"Horse notes" in *N. Y. Herald.*

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The Canada Farmer.

TORONTO, CANADA, FEBRUARY 2, 1874.

Salutary Legislation.

Among the measures now engaging the attention of the Local Legislature, not the least important, is that contained in a Bill recently introduced by Mr. Clark, M P. for Wellington, the object of which is to provide as far as possible against the casualties and frequent loss of life occasioned by threshing-machines and other dangerous farm implements. Most of our readers are aware that in the large majority of instances these accidents result either from contact with the cog-gearing of the machine proper, or getting caught by the knuckles of the "tumbling-rod" when in the act of stepping over. The Bill, therefore, provides that all such exposed portions of the connections and gearing be securely covered. The necessity for some such enactment, every one who has given the matter the slightest attention, will be prepared to admit. Scarcely a week passes without its record of blood, and unless some steps are speedily taken to arrest the evil, "Caught in a Threshing-Machine," will soon have become as stereotyped a heading as "Market Reports," or the "Arrival and Departure of Trains."

The "Arch" Movement.

The following rather spicy extract is from the *Sportsman*, a widely circulated English journal, and an unflinching supporter of Mr. Arch. We quote as follows:—

"Mr. Joseph Arch, the laborer's friend, is getting into a row. Very "large" people are being "down upon" him—including a few subsidized provincial and one or two straggling metropolitan editors—so he must go to the wall. Mr. Arch has, according to the *Spectator*, been a prolific source of agricultural joking. he has been called the "arch-agitator," the "arch humbug," and in one instance the "arch-fiend"—in the last case we fancy the letter "r" has been accidentally omitted; but still the wit is good. Why, under the awful circumstances, does he not bolt, and be done with it? He has asked for a shilling or two more a week for a class of men who have hitherto been housed and fed like dogs—and not anything like so comfortably as many other inferior animals—but what manner of right had he to make such a request? He is an "interested agitator," and should be put down All "agitators"—notwithstanding that they are the choice of hundreds of thousands of their fellow-men—should be put down. Does not the *Pall Mall Gazette*, in a wonderfully plain report, inform us that the Queen's Osborne laborers are receiving 12s. a week? And is this not sufficient for them? They should be ashamed of themselves. Then has not this terrible man Arch said that "agricultural machines require quite as many laborers to manage them as if they were not adopted?" What a horrible fellow he must be—a fellow nearly as bad as one called George Stephenson, who once said, "The greater the number of machines, the greater the number of men required to work! We are getting into a sad state when "interested agitators" like Arch, and a few "penny-a-liners" in Fleet Street, are left to decide how the biggest interest in the country is to be housed and fed! But there is more and more to follow. This terrible man Joseph Arch has had, it appears, the temerity to request, and in the end has succeeded in getting an interview with Mr. Gladstone. Arch must be, as is recorded in a small way, a very large Wat Tyler! Why, this man Arch once worked in the fields, and now he would dare to enter the sacred precincts of St. Stephen's! It is something shocking for the poor starved farmers of this country to contemplate. But Arch and his band of agricultural conspirators had better beware. The farmers may emigrate, and where will the laborers be?"

Agricultural Politicians.

We are glad to notice that the Hon. Geo. Brown, of Toronto, has been made a Senator of the Canadian Government for life. Mr. Brown is editor of the Toronto *Globe*, the leading newspaper in Canada; likewise of the CANADA FARMER, the most prominent exponent of Canadian agricultural interests. He is an enthusiastic lover of agriculture, and a prominent breeder of Short-horn cattle. His inherent hatred of shams of all descriptions made him a successful journalist, and, we trust, will ensure his success as a politician. Hon. David Christie, another Canadian Short-horn breeder, whose personal acquaintance is enjoyed by many American breeders, is also a Senator for life, and is besides the Secretary of State of the Dominion of Canada. Hon. M. H. Cochrane, another breeder, whose acquaintance is quite general among American breeders, is also a member of the Canadian Senate. We do not know but in speaking of these gentlemen in the same breath, we are making strange bed-fellows, for Canadian politics are a sort of Chinese puzzle, which we never had the patience to study out, and between "Grits" and "Tories" (we are not sure but they mean the same thing) we could never perceive the difference. But whatever Canadian politics may be, we feel inclined to say, that if they result in bringing Short-horn men to the front, they cannot be very bad. We should have less Credit Mobiliers, salary grabs, subsidy schemes, defalcations and rascality generally, on this side, if political affairs were relegated to Short-horn breeders We have got to come to the same thing on this side of the line. And if ever Diogenes comes around again with his lantern, he will ask the first thing for a list of Short-horn breeders, and he will find as many honest men as there are names on the list.—*Buffalo Live Stock Journal.*

Concrete for Building.

To the Editor of the Canada Farmer.

SIR:—Can any of your scientific gentlemen give the cause of scab in potatoes, and a remedy if there is one. I also want to know what thickness would the walls of a concrete building require to be, say 13 feet high, and would it not do to put the stones in the frame first, and pour the lime and gravel over them, as well as to mix all together, and also in what proportions the lime, gravel and sand should be mixed. Would not equal parts of each do, that is, one bushel of lime, to two of sand and gravel, and I think wash sand is the best, for it is more binding than pit sand.

I hope he will be explicit on this, as I intend, (God willing) to put up a house next Summer, and give me all the information he can.

E. A. SIMPSON.

[Our correspondent will find a very full article on the subject in the third number of the CANADA FARMER, Feb. 15, 1873.—ED. C. F.]

Agricultural College Education.

Prof. E. M. Pendleton, in his address to the agricultural class of the University of Georgia, talked to the students in the following sensible way:

My *beau ideal* of an agricultural college has been, to have the poor boys of the country, or rich ones either, who have been reared on a farm, and intend to be farmers and nothing else, brought together at a school where a good English education is demanded as preparatory, and a thorough course of agricultural chemistry, geology, chemical physiology and political economy is taught, and the agricultural art exhibited and developed after the most approved and practical style. I say the poor boys of the country, because they have not the means of being educated within themselves, and but few of the rich seem willing to make farmers of themselves. To such a college none would go but those who desire an agricultural education, and we might expect the knowledge they acquire to benefit themselves and their country in years to come.

But I am informed that no such school exists in the land; that the agricultural colleges have many students, but comparatively few who ever intend to be tillers of the soil. They come to be educated, but with other ends in view. I think an agricultural college should first be open to boys who intend to be farmers; next, those who desire to pursue some of the industrial arts; and lastly, the learned professions might come in, if there is any room for them. The agricultural element should be so completely in the ascendant as to give character to it as a profession, and prevent invidious distinctions as between it and other professions. The tuition should be free to all, and the only distinction made should be as to scholarship and behavior. I trust we shall be able in this college to present a good example in these particulars to all others.

The Plague of Darkness.

The thick fog that prevailed on London during the week of the Smithfield Club Show had a singular and very injurious effect on the animals in the Agricultural Hall. Much discussion ensued on the subject, and among others, the following article in the *Mark Lane Express*.

"A change came o'er the spirit of the dream"—a change of the most depressing character. The hopes of the Smithfield Club were high on Monday. On all hands it was admitted that there never had been a better exhibition. The Devons were in magnificent form, and the shorthorns, taking them all in all, had never been surpassed. The entries were large; there was scarcely an absentee from the stalls. The Council were justified in writing that they had great pleasure in reporting "that no animal suffering from contagious and infectious disease was presented for admission, and further, that the animals in the Show remain perfectly healthy at the present time." Almost before the ink of the report was dry, a worse than Cimmerian blackness settled down upon the city. It "darkened the day," as did that terrible plague which fell upon the land of Egypt in Mosaic times, and it lasted a day longer. It was really a darkness which "may be felt." It permeated every ... et, it entered almost into every home. It filled ... Agricultural Hall with a persistency that the highly-fed animals struggled against in vain. On Tuesday night there was an unmistakeable evidence that a large proportion of the beasts were affected in their breathing—that the due per-centage of oxygen was deficient. In the morning several were dead in their stalls. It appeared as if, to alter Byron a little,

> The angel of death spread his wings on the blast,
> And breathed on the face of the ox as he passed;
> And the eyes of the heifer waxed deadly and chill,
> And her heart but once heaved and for ever grew still.

In the course of Tuesday and Wednesday, many of the animals were mercifully saved from suffocation by the application of the pole-axe. A considerable number were removed to private byres, where they did not fare much better than in the Hall, and shortly after their removal were reluctantly consigned to the shambles. Some of them were dispatched to the homes from whence they had come; several were sent to try their chances in Copenhagen Fields on Thursday, and before hands could be "chapped" in ratification of a bargain, the animals rendered "higgling" unnecessary by dropping down dead. It was really a deplorable sight, and the worst of it was that science was utterly incapable of coping with the calamity. There was no disease whatever that medicine could remedy. The dark and laden atmosphere simply blocked up all the vesicles of the lungs, filled them full of black blood, and death was the inevitable result.

The loss to the exhibitors is one that cannot be well calculated. The animals so affected do not make nearly the sum they would have done had the atmosphere been clear and fresh. Many of them which succumbed were not quite ripe, and their owners had intended to keep them on for another year in the hope of winning the blue riband of the yard. But all in vain was their desire. Oil and old ale, nitre and peppermint, were of no effect, and the careful rearing of two or three years was, like Jonah's gourd, blasted in a night.

The best arrangements that the Smithfield Club could make failed on this occasion, through no fault of theirs. Everything that they could possibly undertake to ward off fatality, they did. They stopped all animals from coming that had ever appeared at a previous gathering in the provinces. They employed skilled veterinarians to examine every beast before it was permitted to enter the yard, and yet the mortality has been far greater than ever it was in the days of the rinderpest.

Michigan Agricultural College Farm.

The annexed statement of the receipts and expenditures of the Michigan Agricultural College Farm for the year ending Dec. 1st, 1873, was submitted to a meeting of the State Board of Agriculture on Dec. 30th:

Receipts.

Cash sale of produce	$3,647 00	
Produce sold to farm house	224.00	
		$3,871.00
109.87 tons of hay at $10		1,098 70
119 bushels of wheat at $1.55		184 [illegible]
1,130 bushels of oats at 30c		339 00
1,344 bushels (of 75 lbs each of ears) corn at 60c		806.40
19,270 bushels of roots at 8c		821 60
600 lbs of wool at 50c		297 00
16 ton of corn stalks at $2		32 00
49.5 tons of wheat straw at $2.50		73.75
32 tons of oat straw at $4		128 00
Increase in value of stock as per inventory		471.00
Total		$8,524.11

Expenditures.

Labor of students on crops	$647 21	
Labor of man and teams on crops	913.42	
		$1,560.63
Labor of students, care of stock	436 27	
Labor of men and teams, care of stock	930.82	
		1,367 09
Account of last year with crops of 1873		[illegible]
Seeds purchased		91 28
Plaster and salt		21.75
Repairs of farm implements		40.00
Current expenses of barns		7.25
Current repairs of fences		20 00
Produce on hand Dec 1st, 1872		3,621 00
To balance		1,534.00
Total		$8,524.11

From this it will be seen that the department, after paying all current expenses, has paid for permanent improvements $1,027.98, for implements, $556.63; and for stock purchased, $392.97. It has also paid into the college treasury $31.46 in excess of warrants drawn to the department for current expenses of the department, besides paying quite a number of accounts that are properly chargeable to the current expense account of the college. The farm at present consists of but 165 acres of land under cultivation, besides ten acres in the vicinity of the buildings used for pasturage and meadow, and about 100 acres of partly cleared land used for meadow. The season in many respects has not been a favorable one for farm operations, the work of putting in crops in the spring having been delayed beyond the usual time by heavy rains. The live-stock now on the farm consists of six farm horses, 64 cattle (of which 49 are pure bred and 15 are grades), 119 sheep (of which 43 are pure bred and 76 are grades), and 15 swine. The value of the stock at a low estimate as inventoried is as follows: Horses $750, cattle $9,050, sheep $728, swine $344,50, making a total of $10,872.50. Several valuable additions to the breeding stock have been made during the year by purchases and donations, as follows: A Berkshire boar presented to the college by Frederick Wm. Stone, Esq., of Guelph, Ont.; an Essex boar purchased of Joseph Harris, of Morton farm, Rochester, N. Y.; a Silesian ram presented by Joseph Harris, Morton farm, Rochester, N. Y., the imported Jersey bull "Hudson," purchased of Hon. Samuel Campbell, New York Mills, N. Y.; the Short-horn bull "Rufus," purchased of Hon. Samuel Campbell, New York Mills, N. Y., at his noted sale of September 10th.

The influence of the college in developing in its students a taste for rural pursuits and inducing them to engage in some department of productive industry depends to a great extent upon the success of the labor system, which is made a prominent feature in the course of instruction. All operations in this department have been planned and carried out with reference to this idea, the benefits that may be derived by the students from the system adopted receiving the first attention, while the question of pecuniary profit has been considered as of secondary importance. With the improved condition of the farm the educational features of the labor system have been more fully developed, while the students take a deeper interest in the system of management as they witness the results of their labor in the crops produced. The experience of the past year in this department, both in the field and class-room, has furnished additional evidence of the advantages of combining labor and study in a system of industrial education.—*Western Rural.*

THE TECHNOLOGIST, OR INDUSTRIAL MONTHLY, FOR 1874.—The January number of this standard journal, issued by the Industrial Publication Company, 176 Broadway, New York, has reached us, and, as usual, it is filled with valuable and interesting information. The table of contents gives a list of nearly fifty important articles, not including mere current items of information, of which there are seven or eight columns. Of these articles nineteen are illustrated, the illustrations including two full-page engravings, printed in colors. It is the cheapest industrial journal now before the public, the subscription rate being only $1 50 per year, or fifteen cents per single number, for a large, thirty-eight-page magazine.

We notice with much pleasure that Mr. William Macdonald, Aberdeen (reporter for the *Scotsman* in the norther districts) has been appointed to the editorship of the *North British Agriculturist*, vacant by the death of Mr. C. Stevenson. Mr. Macdonald is remarkably well fitted for the post, to which he has been selected from amongst a large number of candidates. He had an invaluable early training in agricultural work on his father's farm in Glenrinnes, and during the past eight years his opportunities for observing and studying every question connected with the farming interests of the country have not only been of the widest possible kind, but have been taken advantage of to the greatest extent. His skill as a judge of all varieties of stock has long been acknowledged. As a writer he is fluent and forcible; and all these qualifications, combined with his knowledge of and aptitude for newspaper work, pre-eminently fit him for undertaking the direction of one of the leading agricultural journals in the kingdom.—*Aberdeen People's Journal.*

VETERINARY COLLEGE.—The classes in this institution assembled on the 13th inst. Dr. Smith, the Principal, delivered a lecture on the early history and progress made in Veterinary Medicine, and the establishment of the numerous institutions existing on the Continent of Europe and in Great Britain. He alluded to the importance of the study in connection with the science of agriculture, which included as well a requisite knowledge of horses and cattle. He recapitulated the names of several of the writers most distinguished for their labors to advance the Veterinary science, prominent among whom was the late Professor Dick, of Edinburgh. The doctor then took up the relation of the rise and establishment of the Ontario Veterinary College, (of which he is the Principal), the very great encouragement that had been received by its success, almost from the beginning, and pointed out how wide and profitable a field was presented in the United States and Canada for the practice of the profession. Indicating the subjects that would be taken up in the lecture course during the present session, he impressed upon the junior students the great necessity of paying close attention to the study of anatomy, which is the ground work and basis of Veterinary knowledge. Following this was physiology, both of which were pointed out as of primary importance. Further, he observed, that owing to the division of time and the allotment of studies, the students would have to devote a considerable portion to the practical part of their studies. In conclusion, he hoped that the class before him would prove themselves as industrious and successful as any of the classes who had been there before. The lecture was quite an excellent dissertation on the subject which was brought before the students.

Agricultural Entelligence.

Agricultural and Horticultural Societies' for 1874 Officers Elect.

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WEST NORTHUMBERLAND.—John Pratt, President; Geo Carruthers, Vice-President; Richard Cullis, Secretary

Origin of the Elmira Farmers' Club.

That those of our readers who wish to organize a farmers' club for the purpose of mutual improvement, in their special business, in their own vicinity, may learn from others' experience, we condense from the *Advertiser* an account of the origin, organization, and history of the Elmira club, one of the most successful, pecuniarily and intellectually, ever organized in the country.

Just four years ago, a few farmers assembled in a waggon shop one evening, by the light of a single candle, and proceeded to organize a club, or society, for the improvement of their methods of farming There had been no public notice given of such a meeting, only a little casual talk at the market, or on the street There were barely ten men at the first organization, but from the first meeting reporters from the city press were invited to report their talks and the club thus became noted. It now numbers over one hundred members, has a large, new, central hall, belonging to the club, with the first floor arranged suitably for the residence of a janitor's family the rent of which rooms will keep the hall warmed lighted, and in perfect cleanliness. From the beginning this club has carried out each year some gigantic enterprise of benefit, not only to the Elmira farmers, but to those of the whole northern States. In 1870 it held a grand trial of haying implements, on the land of Mr. Hoffman, its President, which was equal to it did not exceed, the great Auburn trial of 1866. In 1871, a trial was had of all kinds of implements for working the soil. In both these years the trials were witnessed by large crowds of farmers who came from far distant sections of the country, to learn from actual trial just what machinery they needed in their business In 1872, the anniversary of their organization was celebrated by a re-union at the house of one of the members. In 1873, a trial of haying and harvesting tools was held on the farm of Gen. Diven, at which the reapers and mowers were worked in every conceivable manner possible, thus "giving lessons" on these machines to the thousands of farmers present. In 1871, a library was started, which now contains twelve hundred volumes, free to members, subject only to the conditions needed for their preservation.—*Country Gentleman.*

THE cattle plague is extending to an alarming degree in some parts of Switzerland. The latest information shews that it has broken out afresh in several cantons, more particularly Berne, Neuchatel, and the Grisons. In the canton of Friburg, where it had disappeared, it has again attacked several districts at once; and in consequence of its virulence in the Vaud, a large number of cattle have had to be destroyed. In the latter canton all cattle fairs and markets have been suppressed until further orders.

NO MORE ARAB HORSES.—So great has been the demand for Arabian horses for exportation to other countries, that the breed has become scarce in many parts of the empire, and with a view to preserving it from extinction—in the provinces of Bagdad and Syria—exportation has been prohibited for the next seven years.

A NATIONAL STUD.—The Government of Quebec has granted $5,000 annually in favor of a National Stud about to be organized with a capital of $60,000, divided in 600 shares, under the management of Mr. Bonnemente, a distinguished French agriculturist, Knight of the Legion of Honour, residing in Canada or the last twelve months. In consideration of this annual Government grant of $5,000 for five years, or $25,000, the company must keep on hand 30 imported stallions, to be disposed of for the season, in the month of May every year, to the highest bidder. The whole scheme has been printed in pamphlet form, which is sent free on application to Mr. Bonnemente, Montreal.

A MEETING of the Highland and Agricultural Society was recently held within the Caledonian Hotel, Inverness, for the purpose of considering the regulations, and premiums of the Inverness show next year. Sir K. M'Kenzie, of Gairloch, presided, and there was a large attendance. Mr. Menzies stated that the date of the show was fixed for the 28th, to the 31st July, and the premiums would be $3,620 above last show at Inverness. This increase, he said, was not owing to the Aberdeenshire agitation, as when that meeting took place, the premium list was being adjusted The premium list was agreed to. It was resolved to hold the competition for the $150 premium for the best thoroughbred stallion at Inverness on the 20th March.—*Farmer (Eng.)*

The Hon. M. H. Cochrane is reserving for future use as a sire in his herd at Hillhurst, Compton, Canada, a red bull calf by Royal Blithe, from Vesper Star, described by Mr. Cochrane as the best of his six exceedingly good members of Mr. Bruere's famous Vesper family, which ranks now on both sides of the Atlantic as a bull-breeding family of the first class. The other five Vespers at Hillhurst are Star of Braithwaite, Vernal Star, Royal Star, Star Flower and Statira. Vesper Star is own sister to Mr. Bruere's Brilliant Star and Beautiful Star, from Star Queen. The Vespers, deriving their blood, in the recent generations, from Booth bulls bred at headquarters, combine the Warlaby wealth of flesh with the great milking properties always carefully cultivated at Braithwaite.—*Bell's Messenger.*

During the year 1873, the list of governors, and members of the Royal Agricultural Society, of England, has been increased by the election of 1 governor, and 351 members, and diminished by the death of 5 governors, and 128 members, the resignation of 168 members, and the removal of 15 members by order of the Council. In addition to this changes, the Council have to record their sense of the loss which not only this society, but the whole world of science, has suffered by the death of one of its honorary members, Baron Liebig, whose chemical discoveries, especially in relation to the production, and utilization of food, have been of the utmost importance to agriculture. The Society now consists of 77 life governors, 59 annual governors, 1,894 life members, 3,949 annual members, 12 honorary members, making a total of 5,991, and showing an increase of 46 members during the year 1873.

THE FROZEN MEAT FAILURE.—Mr. Harrison, who came over in charge of the frozen meat on board the Norfolk from Melbourne has explained that the failure was directly owing to the imperfection of the means by which it was carried out, an imperfection which was discovered only when it was too late to remedy the defects. He holds that the most practical and efficient means is by a combination of ice and salt. He points out that the difference in price between meat in Australia and England would allow for a considerable cost of preserving, but he maintains that the cost by his process is extremely low, He has stated that his freezing apparatus on board the Norfolk was calculated to last 120 days; but shortly after he was on board he found defects at the very points which should be efficient. The men who were employed to fit up the apparatus when the ship started had not always been sober, had scamped their work, and had so concealed these defects that he could not at once detect them. During the first 37 days of the voyage, in the coldest part of the year, he lost 20 tons of ice, and with what he was able to save when he became aware of the defects he was able to maintain 90 degrees of cold for 39 days, including the run from the tropics, but his difficulty was through the loss of the brine.—*Mark Lane Express.*

Breeder and Grazier.

Short-Horn Colors.

The discussion at the Cincinnati Convention indicate that the mania for red colors is on the decline. The suggestion by Dr. Sprague, that premiums should be offered for the best carcass of beef, is but the reiteration of a test suggested by us more than a year ago. We have argued that the new fashions were not based upon any of the old rules in regard to excellence in quality—that good handling, deemed so important by all the old breeders, was no longer a test of merit, and that therefore there was no test as to quality of flesh. We have no doubt but the rage for dark red colors had much to do with this; for although we are not prepared to go the length insisted upon by some in the late discussion, in regard to the dark-red indicating inferior flesh as it is usually accompanied with harsh hair, we are of opinion that the lighter colors are generally superior in quality to the dark-reds. And we know, too, that many of the premium reds, during the last half-dozen years, have been so defective in their handling, that they were really unworthy of this honor. One, exceedingly good in form and style, was, with all that growing and care could do, *too hard* for the showing. Another, equally distinguished and equally good in form, but less stylish, was so defective in coat, with hair so short and thin, as to render it impossible for a judge of a true Short-horn to admire her. Still another, with a hide so thin and "papery" as to entirely disqualify her in the judgment of competent judges, was successful—as we were informed by one of the committee—because her handling was so superior! All these were red in color; but we do not mean to attribute their defects to this circumstance, and only cite the instances as evidence of the utter disregard of *quality* at the great State cattle shows of the country, where the animals have the fashionable color and style. And we have been greatly surprised in this, as in other particulars, to see practical breeders abandon their old opinions, and follow the whims of men who, by prodigal use of money, without information and without experience, were introducing new practices and new standards of excellence in Short-horn breeding.

It is high time to have done with these *whims and fancies*, and to return to the old tests of *sound blood*, with the *quantity and quality of flesh*.

We are greatly pleased, therefore, to observe that so many respectable gentlemen are in accord with the views we have been presenting in these columns in regard to these very questions of color and handling in connection with the quality of the flesh and propensity to fatten.

Some months since we directed attention to the color of the prize animals in Great Britain for 1872 to which we now add those of 1873, showing how largely the red color is in the minority among the best cattle there. At the Royal Agricultural Society meeting at Hull, there were 33 prizes and commendations, 4 of which were awarded to reds, 4 to red-and-whites, 4 to whites, and 21 *to roans!*

At the Royal for Scotland, the 18 honors were divided as follows: 1 to the white, 1 to the red-and-white, 2 to the red, and 14 *to the roan*. At the meeting of the Irish Royal, 2 of the 12 honors went to the reds, 2 to red-and-whites, and 8 *to the roans;* the old Yorkshire Society distributed its 24 honors thus: 4 to the reds, 4 to the red-and-white, and 16 *to the roan color.*

We think it may now be safe to assume that the roan is becoming the most fashionable, as it unquestionably is the most brilliant and characteristic of the true colors of the breed. And yet, partial as we are to this color, we should not advocate exclusive adherance to it, if such a thing were possible; because we can hardly conceive of any considerable herd of well bred animals without "the red, the white, and the roan."—*T. C. J., in Live Stock Journal.*

Points of an Ayrshire.

The quantity of milk which the Ayrshire dairy cow yields, as well as its quality, are so various that we have great doubts if the quotations which we give of several dairies in the west of Scotland can subserve any useful purpose. There is primarily the milking qualities of the cow, which largely influence the production, for there is no fact better established than the profitableness of some cows compared with others, and the consequent importance to be attached to the selection of prime cows. The value affixed to the form and points by the dairy farmer is incalculable; they rarely commit a mistake in purchasing, and it may not be out of place to insert the following ingenious versification of the points of the Ayrshire cow which appeared in a Scotch paper many years ago. They are based on a document published under authority of the Ayrshire Agricultural Association:—

"Would you know how to judge of a good Ayrshire cow?
Attend to the lessons you'll hear from me now:
Her head should be short, and her muzzle good size;
Her nose should be fine between muzzle and eyes;
Her eyes full and lively; forehead, ample and wide;
Horns wide, looking up, and curved inwards beside;]
Her neck should be a fine, tapering wedge,
And free from loose skin on the undermost edge;
Should be fine where 'tis joined with the seat of the brain;
Long and straight upper line, without hollow or mane;
Shoulder-blades should be thin where they meet at the top;
Let her brisket be light, nor resemble a crop;
Her fore-part recede like the lash of a whip,
And strongly resemble the bow of a ship;
Her back short and straight, with the spine well defined,
Especially where back, neck and shoulders are joined,
Her ribs short and arched, like the ribs of a barge.
Body deep at the flanks, and milk-veins full and large;
Pelvis long, broad and straight, and in some measure, flat;
Hook bones wide apart, and not bearing much fat,
Her thighs deep and broad, neither rounded or flat.
Her tail long and fine, and joined square with her back,
Milk vessel capacious, and forward extending,
The hinder part broad, and to body fast pending,
The sole of her udder should just form a plane,
And all the four teats equal thickness attain,
Their length not exceeding two inches or three;
They should hang to the earth perpendicularly;
Their distance apart, when they're viewed from behind,
Will include about half of the udder you'll find,
And, when viewed from the side, they will have at each end
As much of the udder as 'tween them is penned;
Her legs should be short, and the bones fine and clean,
The points of the latter being quite firm and keen,
Skin soft and elastic as cushions of air,
And covered all o'er with short woolly hair;
The colors preferred are confined to a few—
Either brown or white chequered, or all brown will do;
The weight of the animal, leaving the stall,
Should be about five hundred sinking offal."
—*Bell's Messenger.*

Dutch and Holstein Cattle.

Many of our best read farmers allow themselves in the use of the expression "Dutch *or* Holstein," as if they were one and the same breed, or race. Most of our premium lists and judges' awards are based upon the same idea, that the terms Dutch and Holstein are synoymous.

The Holsteins, it is true, have some of the general characteristics of the Dutch race of cattle; some peculiarities in common with all the races of cattle to be found in that long and fertile stretch of marsh region, extending from the confines of Holstein around the borders of France, a distance of some hundreds of miles. In this extent of country, the soil of which is of a low and swaley character—the accumulated deposit of ages—there are certain local influences which divide the *Dutch-land* cattle into many distinct races, giving to each some well defined points, by which distinguishing marks each can be, and is, known.

Thus, while the Holsteins are natives of Schleswig and Holstein, the Dutch cattle, in their purity are natives of Holland. They are strictly a lowland race. As they come to us, built up by the luxuriant feed of the moist climate and low grounds of their native Holland, they are coarse-boned, large and heavy, and great milkers; but when transplanted to our scanty, highland pastures, and to the exposure of our long winters, they do not keep good their claim as extraordinary milkers.

The Holstein race of cattle are smaller than the Dutch, and quite distinct from them in size, color and quality. They are more compactly built, and as far as appearances go, better fitted to climate and pasture conditions. So far as we know, the importations into Maine have stood the test commendably. We, however, would not advise those farmers, whose small purses compel them to leave their cattle to "rough it for a living," to invest largely in the Holsteins on so short a probation.

With the cheese-factory mania so prevalent, the demand is to be for *curd* production cows, and which is the race or breed to best supply the prospective demand, remains an open question. Let those who are gifted with plethoric purses, play at "loss and gain," until a safe, sure selection can be made.

There are several of the Holstein races, being entirely different in many essential particulars. The best of these we may have, or we may not, time and test will tell.—*S. W. in Maine Farmer.*

A CORRESPONDENT, of *Our Dumb Animals*. Says: I have a colt five years old, quite fast and high spirited; but I have never struck him with the whip since I bought him last March. I have taught him to obey my slightest wish, by means of a lump of sugar, of which he is very fond. He will ask for it by nodding his head and neighing. When I first had him, he would not stand quietly for one to get into the carriage; and I determined to try sugar. I gave him a lump, and from that day to this he never offered to move until I am entirely ready. Wasn't that better than whipping.

Cattle Weights at the Smithfield Club.

The system of taking the weights of the cattle as they enter the Agricultural Hall, practiced by this Club, is one of much interest. The difference between live and dead weights is also a matter of important consideration for feeders. Butchers like those animals which "kill well." They desire to have a nice bit of lining over the kidneys. This year the general statement is that the beasts are not so well fed as in former years; and this is accounted for by the fact that meat has been so dear this season, that feeders have sent out their animals in an unfinished state. The undeveloped character of the Scotch beasts has been specially remarked upon. But south of the Tweed also the cattle when slaughtered exhibited the same paucity of suet. It is doubtful whether the rushing of unripened oxen into the market pays. But feeders of course know, or ought to know, best what is for their own interest.

The comparative live weights which we give of the cattle for this year and last shew that there has been a considerable falling off in substantiality, generally. The Devons stood the test of the log best; this year their weight also was heavier than at last Show. In 1872 the greatest weight scaled by this pretty little breed (which must now also be described as hardy) was 18 cwt. 2 qr 27 lb. This year one belonging to Mr. Bond, of Park, weighed 20 cwt. 15 lb. The heaviest Hereford this year was 22 cwt. 2 qr. 18 lb.; last year there was one weighing 23 cwt. 20 lb. The heaviest shorthorn ox was the champion prize-taker among the males. It belonged to Mr. Bult, and weighed 24 cwt. 2 lb. Last year the greatest weight was 23 cwt. 1 qr. 7 lb. In 1872 a Sussex ox brought down the beam at 23 cwt. 3 qr. 12 lb.; this year the highest register was made by a bullock belonging to Mr. Lee Steere. It weighed 22 cwt. 1 qr. 24 lb. The Norfolks and Suffolks seem to be growing in favor with the butchers. They are heavier than last year. The heaviest animal in the yard, as in last year was found among the crosses. The greatest weight last year was 27 cwt.; this year 24 cwt. 2 qr. 14 lbs.—*Farmer.*

Points of Jersey Cattle.

Some years since, (in 1866,) the Secretary of the Royal Agricultural Society of the Island of Jersey, in his report, enumerated a scale of points for bulls and cows, in which neither the black tongue nor the black switch, so much fancied by some breeders is enumerated.

These black tongues and switches, of course, are entitled to consideration, as fancy points—nothing more—although we think it true that they do perpetuate this characteristic often very strongly in their progeny. They are found principally in animals of solid colors, as the shades of gray, and orange and other strong fawn colors.

At the examination of "foundation stock" in Jersey, in 1866, of sixty-nine bulls approved, twenty-four being highly commended and forty-five commended, twenty-three had black switches, six of them being highly commended. The body colors of the twenty-three black-tailed bulls were, six dark gray; four gray; two light gray; three gray and white; three brown; two light brown; one bright brown; one light red, and one of which the color was not stated.

At the same examination 244 cows under three years of age and heifers, all in milk, were approved. Of these, thirty-five were highly commended and 209 commended. Of the 244, thirty-three had black switches; fifteen were brown, bright, dark and light browns; five brown and white; three gray; two red; and, one each of dark gray, light gray, gray and white, fawn, cream and white, dark brown and white, and light brown and white. Two cows had black tails with white tips; one pale red had a white switch; one red, a brown one; one light brown and black points. There were four cows with black and white tails, and ten had white muzzles.

Of the thirty-five highly commended, five had black switches, four of them being brown and one gray; in this lot of highly commended animals one had a white muzzle.

At the exhibition of 1867 at Jersey, the bull which received the second prize was a red and white animal, having twenty-eight points out of the thirty-one which constitute the scale of perfection; this in a class where twenty-seven bulls were exhibited. Of these twenty-seven none were brown, seven brown and white, and four gray, four gray and white; and there were one each of brown, gray and white, red and white, and light red. The average of their scale of points was twenty-five and a half.

Of the sixty-four first and second class heifers shown, grey, grey and white, brown, brown and

white, light brown, dark brown, red and white, pale red, and fawn were enumerated. There were in this lot, only six fawn color, and sixteen red and white.

It will be seen from this, that in the island where Jerseys are natives, comparatively little attention is paid to color; and certainly fawn, so much in vogue among certain breeders, is not a prevailing color, or at least was not at that time. It is, therefore, to be regarded as simply a fancy point. This shows that, in the breeding of cattle there, less attention was paid to color than milk points.

We think that, since the importance of these cattle has been briskly growing, more attention has been paid, in many instances, to their merely fancy points than to a point of more real value,—the quantity of milk given. The Jersey cow always gives rich milk, although the quantity is sometimes not so large as could be desired.

Whether it is desirable or not to breed this, in certain localities, really valuable milking stock to color, remains with the breeder to determine. That it can be done by selection there is no doubt; but, will it pay is the question? To an individual here and there who wants gilt-edged milk and cream from gilt-edged cows, it might be an object, but, with those who breed Jerseys for the money in their udders, we anticipate that they will care little for the colors of the tail so they get lively returns in milk and butter. *Western Rural.*

Critical Time for Colts.

It very often happens that in the third year of a colt's life it falls off in condition, stops growing, and becomes mysteriously poor and emaciated. Disease is suspected, various nostrums and absurd specifics for imaginary complaints are administered, which fail of effect, and it is only after a lapse of time that a measure of improvement takes place, which, however, leaves the colt permanently injured and with an impaired constitution

At this period of the colt's existence an important dental change is going on. The central temporary milk nippers, or cutting teeth, in the front of its mouth are shed, and the permanent teeth take their place. If the colt is at grass it is almost impossible for it to graze, and it suffers partial starvation This is the whole secret of many a colt's sufferings The trouble in such cases would be avoided by occasionally examining the mouth, and when the temporary absence of the nippers is observed, to supply cut feed of tender hay, with ground oats or soft mashes of cut green fodder This provision would tide over the necessarily occurring period of disability, and prevent the otherwise inevitable falling away and poverty of condition, with its disastrous results.—*New York Tribune.*

The Breeding of the Champions at Islington Cattle Show.

The fact that the champion prizes—one for the best animal of either sex—were both awarded to Short-horns, marks an era in the history of this irrepressible breed. They "turn up everywhere; and partisans fight over each victory of the breed as a triumph for their side. Thus it has been said of Mr. W. Bult's noble ox, and Mr. Walter's beautiful Lady Flora, "Both were by sons of the pure Duchess bull, 7th Duke of York," as if this statement revealed at all the condition of their pedigrees In reality both animals score a success, not for any adherent of "pure" breeding, but for those who advocate a free admixture of the blood of different Short horn tribes, so that personal claims be duly regarded. Lady Flora was of the Lancashire tribe of a good old pedigree, not half appreciated as it deserves. Her dam was by a Booth Farewell bull, her granddam by a Knightley bull. Thus, on the mother's side, the blood is as mixed as can well be. The sire, though he was indeed by a pure Bates bull (as has been said), was out of a cow tracing through Mr Bowley's herd to that of Rev. Henry Berry—one who preached and practiced what now would be considered very loose breeding.

Mr. Bult's ox has a very similar pedigree. The half-Bates sire, owned through his dam, mixed blood, going back to Lady Maynard, through Wiseton and Chilton, and the dam of the ox, so far as this is ascertained, traces back by sires of very mixed descent, to Sir Knightley's Anemone, of the same tribe as that from which Cawlma came, and Mr. McIntosh's Lady Knightleys, &c., all the descendants of Brother, to R. Colling's white heifer. And Anemone had the Duke of Cambridge cross, which has been objected to, and had later alliances of all sorts and kinds, so that they were Short horns.

On the whole, whilst the success of these two animals shows the value of the breed, it conduces little to the common desire to exalt a part of the pedigree animals at the expense of the rest. Both trace back to the very oldest blood of the Teeswater cattle, and *both have this blood through many different channels.* But the good old midland counties fashion of turning out the very best of beef, whilst northern breeders wrangle about blood, seems fully observed in 1873.—*Cor. Field.*

Brood Mares in Spring.

Having for twenty years been a breeder, to some extent, of our noblest domestic animal, the horse, I thought a short article on the care and general management of the brood mare at this season of the year might not be uninteresting. The best feed for the brood mare is corn-stalks, or good timothy hay, with four quarts of ground oats and wheat bran, equal parts each day. The ground oats and bran not only enable the dam to make all necessary preparation to supply the coming foal with nourishment at the time when most needed, but it keeps her healthy and strong, and enables her to furnish the growing foetus with the very best kind of material to make the best bone and muscle. The dam should have moderate exercise, but it should be regular. If she is used in a team, she should not be driven faster than a walk, nor loaded too heavy, for in either case there is danger of injuring the dam and ruining the foal. She should be housed or sheltered nights, and in all stormy weather.

As foaling time approaches, she particularly needs the practiced eye of the careful and experienced breeder. For she should be watched both day and night, as many a valuable colt has been lost, that two minutes labor, at the particular time, would have saved. As soon as the colt is dropped, the attendant should see that its head is free from the blanket, as it will otherwise soon smother or drown. The next thing is to sever the umbilical cord about five inches from the foal, and tie the end next to the young colt with a string, to prevent bleeding; this, if possible, should be done before the dam rises, as many a foal has been ruptured at the navel by the dam rising before the string was severed After the above has been promptly attended to, leave the dam alone with the foal for half an hour. If, at the end of that time, through weakness or any other cause, the young foal has been unable to secure its natural nourishment from its dam, the attendant with whom the dam is most familiar should lose no time in rendering the necessary assistance by holding the colt at the side, and by putting the nose to the teats of the dam.

After the colt is able to draw its nourishment from the dam without the aid of the attendant, little need be done, but furnish a shed, if the weather is inclement, and a good liberal supply of hay or stalks, and a peck of ground oats and bran per day until there is a full bite of green spring grass.—*Cor. Michigan Farmer.*

Fat-Tailed Sheep.

At a recent meeting of the Farmers' Institute Club of New York City, Mr. L. A Morrill, in an address on the different breeds of sheep gave some interesting particulars as to the characteristics of this curious breed as it appears in Syria:

Mr Russell, an English traveller says:—"The dead weight of one of these sheep is from fifty to sixty pounds, of which the tail makes up fifteen to sixteen pounds, the tail alone composing one-third of the whole weight. This broad flattish tail is mostly covered with long wool, and, becoming very small at the extremity, turns up. It is entirely composed of a substance between marrow and fat, serving very often in the kitchen instead of butter, and, cut into small pieces, makes an ingredient in various dishes. Animals of the extraordinary size of 150 pounds are, however, very rare, and kept up in yards, so as to be in little danger of hurting their tails from the bushes. The shepherds in Syria fix a thin piece of board to the under part, which is not, like the rest, covered with wool, and to this board are sometimes added small wheels, whence, with a little exaggeration, we have the story of the Oriental sheep being under the necessity of carts to carry their tails. But the necessity of carriages for the tails of the African sheep, mentioned by Herodotus, Rudolphus and others is real. The tail of the tammal when fat actually trails, not being tucked up like the Syrian sheep."

A distinguished writer on sheep supposes the broad or fat-tailed sheep merely a variety of the fat-rumped, the strange collection of adipose matter having only shifted its situation from the posterior part of the hunch to the superior part of the tail. This may have been at first accidental, and perpetuated by accident or design. An individual of this unique breed of sheep I saw a few days since in Prospect Park, Brooklyn; the tail, however, severed of half its natural length, and very ungainly in its general structure. In closing, I will mention another curiosity and to me, a perfect anomaly, viz., a hybrid being a cross of the common red deer and sheep. Both belong, it is true, to the order *ruminantia*, but it is the first and only instance that has ever come to my knowledge.

The common goat and sheep closely approximate in anatomical structure, and sometimes copulate, but no instance has occurred where offspring has followed. This hybrid is covered with straight hair, in color reddish-brown, legs rather long, and uncouth in general outline. The herdsman informed me that it was found and purchased by a gentleman now living in New York, when travelling in Europe, and presented to the Park Commissioners. This great curiosity and the fat-tailed sheep may be seen any day herding with a small and beautiful flock of full-bred Southdowns, at Prospect Park, Brooklyn.

Bred and Thoroughbred.

Some indefiniteness has been occasioned in the use of the term thorough-bred because of its having been drawn from horse literature, and adopted from thence by writers on cattle. The thoroughbred horse is a name given to a breed of horses of a certain origin and certain characteristics, similarly as the terms Suffolk, Punch or Clydesdale. It is a name by which a breed is known. A "thoroughbred horse" is not necessarily less mixed with alloy stains of blood than the horse of another breed. Since, however, the horses classed under this name were imported into England as a foreign breed, and the pedigree has been kept of the augmenting progeny, the idea of a greater purity, or oneness of blood, than is possessed by other breeds, has gained currency, whereas the ancestry may only have been traced by name for a longer period. When cattle of breed have had their ancestry recorded for some length of time, or perhaps for one or two generations only, persons have adopted the term thoroughbred to describe them, as also in the case of swine, sheep, dogs, &c. But the simple possession of a pedigree cannot justify the use of this term descriptive of individuals, since in many instances they are very diverse among themselves. It is sufficient to call Short-horns, Short-horns, Ayrshires, Ayrshires, and so on, unless the animals breed more uniform progeny than characterize the breed to which they severally belong. Any one having upon his farm several families of one breed perceives a difference of capacity in them to perpetuate their own forms and qualities. This difference clearly betrays the fact that some are to be regarded as more or less thoroughbred than others. Such studies offer a test of the degree any animal is thoroughbred. The word is expressive of a quality much desired, but the possession of this single excellence may not be adduced to prove that the animal is in the possession of other excellences that render an animal worthy of being retained upon the farm. It is time that the thought should be permitted currency that some animals of a stock denominated thoroughbred are decidedly bad—that *proof of the thoroughbred quality is not guarantee of excellence otherwise.* It must however be allowed that the foresight and attention which has served to engraft this quality upon a stock, has in general promoted the equal growth of other excellences, so that when an animal becomes thoroughbred to any considerable degree, the chances are in favor of its being a good animal. That which is not so much as a guarantee has weight in establishing a presumption that the animal which is this has much more to commend it to our regard.

JOSEPH N. STURTEVANT, *in the County Gentleman.*

—*Bell's Messenger* (English) says that an organization has been formed in Denmark, the object of which is "to work new processes for the preservation of butter, with a view to its being forwarded on by sea." The capital of the association is £19,000

COST OF KEEPING SHEEP.—The *Michigan Farmer* says: A sheep cannot be kept at the present market value of land, of labor, of hay and of grain, for the price of its fleece, even if that fleece weighs five pounds of washed wool! that will bring 40 cents.

CLIPPING SHEEP TWICE A YEAR.—A correspondent of the Department of Agriculture says,—"The shearing of sheep twice a year diminishes the amount of wool, as I have satisfied myself by experiment. One fleece, annually shorn in the spring will weigh more than both the fall and spring fleeces from the same sheep."

The Dairy.

American Dairymen's Association.

Ninth Annual Convention.

The preliminary meeting of the Ninth Annual Convention of the American Dairymen's Association was held in Association Hall, Utica, New York, on Tuesday afternoon, the 15th instant. At half-past eleven o'clock ex-Governor Seymour, the President, called the Association to order. A Committee to regulate the order of business was appointed, who brought in their report in the afternoon, after which the business proper of the meeting commenced by Mr. O. S. Bliss, Secretary of the Vermont Dairymen's Association, reading a paper upon "butter making." Mr. Bliss read as follows:—

"Upon nearly every dairy farm in the country, however excellent in the main, there is, somewhere in the pasture or runway, one or more noisome sloughs, or swales, where, during the long drought, which we are sure to get, as often as two summers out of three, the cows eat enough coarse, ill-flavored herbage to affect the flavor, and perhaps the color of the butter. They resort here, too, in fly time, and often, after standing in the mud and filth for an hour or two, turn around and sup up the slough water charged with various forms of impurity, which are certain to make their mark on the milk and butter. It is idle to argue that an abundance of good water elsewhere will obviate these evils; cows frequently acquire morbid appetites, and prefer the filthy to pure water. There is but one way to guard against the evil, and that is to remove the temptation wholly and entirely. To put a few rods of drain tile into such a place and draw off the water, and then to burn off the coarse swale grass and weeds, and harrow it over thoroughly, and sow on a mixture of pasture grass seed, or even of June grass alone—which is of all others, the one most valuable grass for the production of butter—at an expense of a very few dollars, so few as hardly to be missed, will sometimes have a most striking effect upon the quality of the product of a whole dairy. Nor is that the only advantage. It will produce enough, more and better feed to pay the whole expense in a very short time. It is not always necessary to resort to thorough drainage in order to relieve pastures of their more obnoxious features in this respect, but it is necessary in that manner, or by open ditches, or in some other way, to remove all sloughs of stagnant and pool water, and the vegetation that grows out of such, in order to be entirely sure that the butter produced shall be fine flavored, and of good texture, especially when the cows are, by reason of drought, forced into them for either food or drink. I have known instances when the laying of 30 or 40 rods of tile has converted an acre of land that was a nuisance, a pest, an eye sore, into an acre of most valuable land, and supplied a herd of 40 cattle with all the pure water they wanted to drink in the driest season. The butter produced from hay and grain grown upon drained land, is also better in every respect than that produced from the fodder grown upon undrained land. This is especially true of the texture of the butter. I have several times, in this connection, alluded to the texture of the butter, and it may seem to some of my hearers, that I am laying undue stress upon that. Such is not the case. The quality of butter is very largely dependent upon texture—in fact, texture constitutes quality, and the quality of the food consumed by the cow has fully as much to do with it as with the aroma. Butter may have an excellent, and entirely satisfactory aroma, and yet if greasy, salvy, and lacking texture, it will be deficient in flavor—will lack that especially delicious "quality which gratifies the palate."

I have not sufficient knowledge of the business to speak advisedly upon the subject of steamed, or cooked food, but, unless it is cooked quite dry, it is not probable that any particular advantage will result. I know from experiment that dry shipstuffs, and meals, are better than wet. The chopping, or chaffing of dry fodder, and mixing it with pulped mangold and meal, or bran, and laying it away in messes for a few days, till it begins to develope heat, is an economical, and, I believe, a most excellent method of preparing food for a butter dairy. The mass becomes homogeneous, and is eaten more freely, and digested more perfectly than when fed in separate parcels. If it is necessary to give the cows any fodder of a low quality, it can as well be hidden here as in the steamed mass, especially if the mass is left till it gets quite warm. I believe in giving cows all the food they will eat. We hear a great deal about the evils of over feeding, and "pampering," but according to the best information I can get, there are a thousand that are not fed enough where one is overfed. It is always wiser to use a machine to its full capacity, and when it is used up get another, than to keep it along to rust out. I would not be understood that there is no such thing as over-feeding. Of course I would not argue for indiscriminate stuffing with rich food, but I do insist that there is no such thing as over-feeding with appropriate food. An abundance of clean water is necessary for cows, but I have yet to learn that "pure soft water" is any better than "hard limestone water" for a butter dairy. The cows may relish one kind better than the other, but I think that is much with them, as with the human family, the result of habit.

An interesting discussion on the relative merits of dry and wet food followed, in which Mr. Bliss gave his opinion in favor of dry food, which, he contended, was necessary to produce the best kind of butter. The juices in the stalks of plants, he said, were very prejudicial to butter-making. Several of those present differed from Mr. Bliss, and in favor of wet food instanced the beneficial effects of wetting dry food.

A paper was then read by Mr. L. T. Hawley, of Onondaga, on "Making and Marketing Butter."

Mr. Hawley's paper considered the two methods usually pursued—churning the cream only, and churning all the milk with the cream—and insisted upon the necessity of perfect cleanliness in the food and drink of cows in the dairy and in the manufacture of the butter, and in the place where it was stored.

A discussion on the cooling of milk followed, when Mr. L. B. Arnold said that the cooling removed any animal odor if the milk was not reduced below 60°, that the odor could be extracted by heating the milk and when the vapor was reduced in temperature to 60° it condensed into a volatile oil; but if the milk was cooled rapidly to 55° the volatile oil, or odor, was condensed in the milk. He thought that if a system could be invented for raising the temperature to 130°, and then cooling, the odor would all escape, and all the cream rise. Mr. A. Willard said that Swedish butter was made from milk cooled with ice-water immediately upon its reception at the factory, and the butter brought the highest price in the London market. Mr. Stewart, however, attributed the good quality of the butter to the feed given.

Mr. Hawley estimated the loss to dairymen in the State of New York from improper butter-making at $20,000,000 annually.

An interesting address was delivered to the Convention by Mr. Greene, of Pennsylvania.

Butter-Making in Creameries.

It is well known that the finest grades of butter are made at creameries, or in private dairies managed essentially upon the creamery principle. Each season shows a finer and more decided discrimination in qualities of butter in the markets, and proves that fastidious tastes appreciate the pure flavor of creamery butter. The market reports never show a superabundance of fine butter, and there is absolutely no danger from over-production.

The question is not whether we shall make butter, but how shall we improve the quality of our butter. May there not be a sufficient amount of fine butter produced to force down the price of the detestable stuff that constitutes so large a proportion of the entire product, and discourage its production? The question is not whether we shall make skim cheese, but how shall we make better skim cheese. The fact is that much greater skill, much closer attention, and much better command of expedients is required in making skims than in making whole milk cheese. Many a successful operator of a full milk cheese factory might fully satisfy himself on this point by making the trial. There seems to be in skimmed milk a natural tendency to the extremes of dryness, or of premature decay, and to keep between these extremes in all cases, I venture to say has not been the good fortune of any manufacturer. Those who have acquired the greatest skill, if honest, will confess that they acquired it only after having made repeated failures and plenty of worthless cheese, and that even now they sometimes meet cases that baffle their skill. One of these stated to the writer that he sacrificed in a single season $500 worth of cheese. These are simply plain, unvarnished facts in regard to the manufacture of skim cheese.

At present, success in conducting creameries, means a superintendent with skill, quick perception, quick decision, prompt action, and an amount of energy sufficient to counteract, at least, in a measure, the damaging effects of negligence on the part of the dairymen. When all milk shall be subjected to a process of aeration, as well as cooling, then will the character of both butter and cheese, but particularly of butter, be greatly improved. When milk becomes tainted, either from the food of the cow, the health of the cow, from the stable, or from standing too long in close confinement, the cream partakes tenfold more of those taints than the milk. In such cases the cheese would be better without the cream than with it. While butter made from cream of that character would show the taint to an extent that would render it worthless for the table. It is a fact too little appreciated, that the quality of butter is more sensibly affected than that of cheese by difference in breeds, difference in soil and pasturage, by the habits of the people, and in short, by whatever influence is exerted upon the character of milk, so that in many cases very fair cheese may be made where you could make only a very inferior quality of butter.

The practice of deep setting has a great advantage in economy of space, but it has the counter disadvantage of vast expense and heavy labor. Inventive genius must soon supplant them with something more generally acceptable. We recognize in butter making nothing of the nature of a fixed science. We regard it as a long neglected science that has just arisen from a state of slumber, as it were, and that full progress with its handmaid until, in a few years hence, we shall be surprised to turn back and recall the state of progress that seems to us now quite encouraging.

In answer to a question as to the number of pounds of milk necessary to make a pound of butter, Mr. Greene said that he had not tried to exhaust the milk, but was in the habit of leaving sufficient in it to make a blue skim cheese. Thirty pounds of milk would make two pounds of this cheese and one pound of butter. Mr. Greene favored deep setting.

In answer to a question, Mr. Arnold said that the acid in sour cream did not act upon the butter. But in the sour milk alcohol is formed by fermentation, and this alcohol destroys the butter.

Mr. Sheldon was called upon to read his paper upon his experience in making cheese with milk delivered but once a day. It was as follows:—

Mr. Sheldon's Experience.

During the season of 1872, some of the patrons furnishing milk at my factory were desirous of being relieved of the labor of delivering milk twice a day, and requested of me the liberty to keep their milk home at night, agreeing to care for it in a suitable manner, and bring it in good condition in the morning, in some instances the night's and morning's milk together, and, in other instances, where the messes were larger, in separate cans. These patrons had an abundance of cool running water in which they might set their cans during the warm weather, and, as it would save them a journey of four or five miles each day, I readily acceded to their request. In fact, I was desirous of the opportunity that would thus be afforded to test the practicability of delivering milk but once a day. Throughout the season the condition of this milk which was delivered but once a day was fully up to the average standard of the other milk brought twice a day, as far as it could be determined without an actual test by working separately. The season closed leaving upon my mind an impression favorable toward delivering milk but once a day for the manufacture of cheese.

At the commencement of the cheese-making season of 1873, we expressed our willingness to receive milk but once a day from all who would care for it in a proper manner, and bring it in good condition, unskimmed, to the factory. We gave such instruction, from time to time, as seemed needful, particularly insisting upon a thorough airing. Nearly one-third of the milk brought to the factory came but once a day; those furnishing the other two-thirds preferred the delivery to the care of the milk, or were unfavorably disposed toward the once a day system. Some of this latter class claimed, that in addition to the extra delivery, they sustained a loss in having their milk made up with the once a day milk. To satisfy them, as well as to carry out an original purpose, I instituted a series of experiments, working each class of milk by itself, noting the amount of cheese from each, as also its quality, probable value, and percentage of shrinkage. The first experiment was made July 12. The temperature of the atmosphere at sunrise was 50 deg., and the evening previous some 10 degrees warmer. The day's milk was worked in three vats. For convenience we will designate them No. 1, No. 2, No. 3; No. 2 being the vat in which, in this, and the following experiments, the once a day milk was worked.

No. 1 vat, with 3,919 lbs. milk, was taken up four and one-half hours from the time of setting; No. 3 vat, of 3,797 lbs. milk, was taken up five hours after setting—the two vats producing 847 lbs. cheese, and requiring 9.109 lbs. milk per pound of cheese; No. 2 vat, of 3,662 lbs. milk, was taken up five and one-half hours from time of setting, making 290 lbs. cheese, using 9.389 lbs. milk per pound of cheese; a

loss in that amount of milk, as compared with the other vats, of 11 lbs cheese, or 2 82 per cent. The cheese of the second vat was drier, and firmer than the other cheeses.

Sept. 24, seventy three days from the press, these cheeses were weighed again No 2 vat had lost 33 lbs., or 8.46 per cent. ; Nos. 1 and 3 had lost 69 lbs , or 8.14 per cent. Seven days later these cheeses were weighed again 2nd vat had lost 3 lbs. more lost weighing, or 9 23 per cent , 1st and 3rd vats had lost 6 lbs., or 8 85 per cent , being a shrinkage of 38-100 of one per cent. more on the firm, dry cheese, from the milk delivered but once a day, than on the more open, and less valuable cheese, made from the milk delivered fresh from the cow both evening and morning. The result was not expected

July 15, the second experiment was made The temperature of the previous night had been such as to try the keeping qualities of the milk , that kept at the factory was standing at 66 and 68 degrees before the morning's milk was added. No 1 vat, with 3,759 lbs. milk, was taken up three hours after setting, making 392 lbs cheese, using 9 589 lbs milk per pound of cheese , the acid had become very sharp at the time of taking up the curd No 2 vat, with 3,582 lbs. milk, was taken up five hours after setting, making 373 lbs. cheese, using 9 603 lbs. milk per pound of cheese. No 3 vat, five hours from setting with 3,790 lbs milk, made 399 lbs cheese, using 9.498 lbs milk per lb of cheese In this experiment, the once a day milk lost 2¼ lbs as compared with the other, being a loss in quantity of 63 100 of one per cent. Seventy days from press, the cheeses were weighed again First vat had lost 32 lbs , being 8 16-100 per cent Second vat, 27 lbs or 7 21 10 per cent. Third vat, 32 lbs , or 8 02 100 per cent Seven days later these cheeses were weighed again No. 1 had lost 4 lbs , or 9 18 100 per cent No 2 had lost nothing since previous weighing No 3 had lost 1 lb. Nos. 1 and 3 had lost 8 72-100 per cent., while No 2 had lost but 7 21 100 per cent , being in this instance a difference in shrinkage of 1 51 100 per cent. in favor of the milk delivered once a day No. 1 vat in this, having firmness and quality in excess of the other two, lost 9 18 100 per cent , being 1 97-100 per cent. in excess of the second vat

The third experiment was made August 7th The temperature of the atmosphere was 68 degs. in the morning; the previous evening 72 degs. The vats were standing at 59 and 60 degrees No 1, with 3,553 lbs. milk, made 378 lbs cheese, using 9.399 lbs. milk per lb. of cheese. No 2, with 3,036 lbs milk, made 328 lbs. cheese, using 9.256 lbs. milk per lb. of cheese ; and No. 3 vat, with 3,438 lbs. milk, made 368 lbs. cheese, using 9 3-42 lbs. milk per pound of cheese. In this instance, for the first time, the once a day milk makes the most cheese, being a gain over the other vats of 1. 2-10 per cent. The curds worked uniformly, and came up about five hours from the time of setting. The once a day milk, though not quite so close and meaty as No. 1 vat, compared favorably with the average of the other two. Forty-seven days after these cheeses had lost —No. 1, 23 lbs , 6 08-100 per cent , No 2, 20 lbs , 6. 09-100 per cent. ; No 3, 21 lbs , 5. 70-100 per cent, Twenty-five days after they had lost—1st vat, 4 lbs , or 7. 14-100 per cent from the press , No 2, 4 lbs., or 7. 31-100 per cent. , 3rd vat, 5 lbs., or 7. 06-100 per cent.

The fourth and last experiment was made August 11. The previous night had been cool No. 2 vat, with 3,006 lbs. milk, made 334 lbs cheese, using 9 lbs milk per pound of cheese. Nos 1 and 3, with 6,757 lbs. milk made 757 lbs cheese, using 8 937 lbs milk per pound of cheese. In this instance there is a loss in the once a day milk of 59 100 of one per cent. Forty-three days after the second vat had lost 17 lbs., or 5.08-100 per cent., first and third vats, 46 lbs., or 6.08 100 per cent. Twenty-five days later the second vat had lost 7 lbs , or 7 18 100 per cent , the first and third, 6 lbs., or 6.87-100 per cent. Here is a marked instance of uneven shrinkage, the cheese from the once a day milk in the first forty three days shrinkage one per cent. less than the other cheese, and in the next twenty-five days shrinking 1.36-100 per cent. the most.

It would seem from these experiments that the drier, firmer cheese, requiring the most milk for their production, also shrink the most These experiments have raised in my mind the enquiry whether or not in the manufacture of cheese there is a point which, if we pass, we not only lessen the product, but also increase its shrinkage apacity , as well as a point which, if we do not arrive at, we increase the product, and at the same time decrease the capacity to shrink. Also the question, will there not be a time when these firm cheeses, that show the larger percentage of shrinkage, will cease to shrink, or shrink in a less ratio than the others with which they have been compared; similar to the instance of uneven shrinkage as noticed in the last experiment.

As to the aggregate result of these experiments regarding quantity of cheese produced, the once a day milk used on an average 9 323 lbs. milk per lb. of green cheese, and 10 103 lbs milk per lb cheese as last weighed, showing a shrinkage of 7 789 per cent. The other milk used 9.29 lbs per lb. of green cheese, and 10 035 lbs. per lb. of cheese as last weighed, losing 7 929 per cent The shrinkage is 14 100 of one per cent less on the milk delivered but once a day than on the other, but there is a loss in quantity of 684 1000 of one per cent. to charge to the once a day system. But when we come to the market value, this percentage of loss is offset by the superior quality of second vat in July 12 experiment So good a judge of cheese as R Bamber, of New York, placed it one-half cent per lb. ahead of those made that day in Nos. 1 and 3 vats. Figuring those cheeses at 13½c., and the balance of the cheese at 12c, the once a day milk brings $0 0929 per lb , the other milk, $0 01299 per pound ; being a difference of three cents on 100 000 lbs of milk in favor of the once a day system

In making these experiments, each cheese was weighed separately, and marked what it weighed in pounds "up weight" Perhaps the results would have been modified, had a more accurate system of weighing been adopted. The general results of these tests accords with our observation and practice for the season ; and we think we can safely say that no losses were sustained by any patron because of this manner of delivering milk, while, to those who availed themselves of this plan, some 5,000 miles travel was saved during the one hundred and fifty-one days we were making cheese

SECOND DAY

The Association met on Wednesday morning, when an address from the New York Butter and Corn Exchange to the Convention was read, after which the paper on butter-making, by Mr. O. C. Blodger, of Chautauqua, was called for, and read. It was, in part, as follows :—

About the kind of cows, their feed, the manner of making butter, I propose to make a few suggestions, which will tend to show in what direction we are drifting upon these points.

It appears that the smaller breeds of cows, fed upon the hill-sides, where grass does not grow rank, or abundant, but more sweet and delicious, where the animals are on the move the greater part of the day, are conditions more favorable for the production of milk in its perfect purity, than when produced from the larger breeds—more ponderous animals—that must needs be fed upon more abundant pasturage, eat their fill, and lie down longer to rest than the smaller animals The indications seem to point plainly toward the Alderney as the coming butter cow of this country. Don't go home and blab now that I said "that fine butter can only be made from Alderneys, and that fine butter cannot be made from short-horns" That would be spreading it on too thick I do not say but that the larger animals can be handled in that skilful manner, observing all these necessary requisites But I should say, upon general principles, that it would require the greater skill to strike that happy mean in their management the result of which is that desired condition of "perfect health," than in the more lithe and smaller animals

But that it can be done was proved by a skilful breeder of short-horns in Chautauqua county (Mr Ira Young), who made butter this past autumn from his herd of thorough-breds that was pronounced "faultless" by experts in New York city Assuming that perfect physical happiness is the index of perfect physical health, which would most likely enjoy an all-day trip up the hillsides after the grass—is it the sixteen hundred pound Durham cow or the more active Alderney, and which would be most likely to come back at night overtired and overheated? Which would be most likely to convert a trip up Pike's Peak into a pleasure excursion—Barnum's fat woman, or the female celebrity who rode up in the rain on horseback, straddle, to see the sun rise?

An addition of grain (fine ground) to the daily feed of a cow, improves the quality and increases the quantity of her produce. It pays a better net return to feed corn meal to cows with grass, than with hay—better with cornstalks than with hay. It pays better to feed the meal and hay at different hours of the day, rather than to chop up the hay and mix meal, hay, and water in an inseparable mass. Why? Because hay is harder to digest than meal; takes longer This is the reason that nature passes meal at once to the fourth stomach.

Some people express alarm when they discover that meal is passed to the fourth stomach, thinking that something ought to be done about it. Is it not safe to assume that nature understands her business, until proven to the contrary by better authority?

But does it pay all butter-makers to feed grain? Perhaps not. But it pays for those who keep good cows—who handle their milk so as to get all the cream, and from the cream all the butter, and this of good quality—then, with still enough left to market his goods so as to get their full value.

To illustrate at short hand :—

A buys grain at $1 per cwt., cares for and feeds his cows skilfully, same with the milk, cream and butter; ships to his commission house, and sells for 40 cents per pound. Pays.

B buys grain at same price, cares for animals, with cream and butter, unskilfully ; goods poor , sells for 25 cents. Does not get his money back.

Conversing with a successful dairyman, near Chautauqua lake, recently, he gave me the following experience He had kept an account of his farming operations for years, and could readily refer to figures for any given season : "Since I have been adding grain to the dairy summer feed of my cows, I have increased their product in quantity, and so far improved its quality, that my present sales exceed my former sales sufficiently to more than cover the expense." He recapitulated as follows :—

Grain feeding—

1. Improves quality of product
2. Increases quantity.
3. Improves quality and quantity of manure, thereby improves the farm.
4. Could keep more animals on a given number of acres ; and saved a better net profit after squaring up all around.

Another public educator made the following statement to a gentleman recently, during his visit to Chautauqua county : "Your people have no business to feed grain to cows in a country where such sweet, delicious grasses are grown, as here upon the beautiful hillsides of Chautauqua county. Your farmers should not fool away their money for 'fine ground meal,' as they call it. They should feed more grass.

Why, my dear sir, we do feed all the grass that we can coax out of those "beautiful hillsides"—every spear of it. "But you must feed still more," says he. "We'll do it, but we must wait till more grows —next year."

The question then stands, while feeding all the grass that grows, can we purchase corn of the West, and with this life-supporting material added, enhance the value of our butter crop sufficiently to pay the West for her corn, and have a greater net profit left us (for labor and capital invested) than when we feed the grass from the hillsides alone? The general result of our experiences is best answered by the fact that the farmers, after carefully noting the result on this point for years, are steadily increasing their purchases of the West from year to year.

Mr. Crump objects to feeding grain to cows, upon the grounds "that 'taint natural" He argues that she is made for the express purpose of extracting her living from such food as contains the smallest proportion of life-supporting material in proportion to its bulk—grass-straw (after threshing), corn-stalks (after husking), roots, &c. That is Crump's opinion, and he means to stand to it. Well, let him stand, while we interrogate nature on this point. Do we not read, from the physical construction of the cow, that she is provided with a complex chemical laboratory for digesting all the different kinds of food in question? First, grain (say fine meal), easily digested. Other animals can digest this that have but one stomach (process easily effected), so nature sends it at once to the fourth stomach (Would do the same with toast and tea.) Now feed hay or straw, harder to digest, requires a longer and more complicated process, passes through more stomachs. Perhaps the mastodon, that lived on still grosser food—branches of trees—had still more stomachs.

Again, turn a cow into a field containing ripened grain and grass, will she eat the grass and straw and leave the grain untouched, giving as a reason that it is not "natural for a cow to eat grain," or will she eat both grass and grain? An experiment has been defined as asking nature a question The result of that experiment, the answer that nature gives you. Now, when the Western New York Butter-makers, the State Dairymen's Association, or the American Dairymen's Association, or even good Mr. Crump himself, gives us one answer, and nature gives us an opposite answer, which shall we receive?

One sure rule for reducing poor milk in extreme hot weather is to have no shade for cows in pasture. Mr. Crump wants to know what that has to do about it. He argues that when animals have convenient shade, "they will fool away too much time enjoying themselves when they ought to be eating grass." Mr. Crump is a fictitious character, but I quote him often,

because I like his style, and because he is the representative type of many agricultural writers and speakers in this country. He is partly right about the eating. Animals that have no shade will feed more at such times than those that can get out of the broiling sun They eat because they can't think of anything else to do.

Observe animals closely upon such days, and you will find that they go out into the sun a few moments and feed, and then return to the shade. Place your hand upon their backs at this time. They will be oppressively hot. If she has no shade her blood becomes heated, nature's process of digestion, and assimilation is thrown off its balance—result: an unhealthy, or not perfect product of milk, cream, and butter

An addition of grain for feed at such times morning and night, saves her the necessity of spending more time in the hot sun than she has a mind to. Final result—a healthier product

We listen to the discussions, and interesting details from our cheese making friends Now, gentlemen this thing of butter-making is some like sliding down hill. When you have got to the top with your sled, the rest is all fun—you go right along. So when cleanliness is gained, and a pure, rich quality of milk is obtained, the process is very simple. Set your milk in a way that comes the nearest to keeping it from 62° to 65° in light and pure air. Skim in the right time, soon as sour. Churn in the right time, say from 12 to 24 hours. Wash with plenty of water, more water the better, but stop washing just as soon as the buttermilk is all separated, press on the water salt, with ¾ oz. Ashton salt to the pound; work just enough to mingle salt and butter, and let stand 12 hours, work a little, just enough so that it may not be streaked, and also to expel what water may remain Pack in a clean, sweet package, and you have got what everybody should have to eat—gilt edge butter.

Now, gentlemen, if firm butter may be called healthy, can you say that the opposite quality is sick? I won't say it—if I did the newspapers would be twitting me of it—but if you will say so, I'll stand by you The poorer the quality of butter when completed, the faster it runs down As John Randolph said of the new Constitution of Virginia, "It is born with the sardonic grin of death upon its countenance."

In the afternoon, the discussion on Mr. Curtis' address was followed by Hon. X. A. Willard, of Herkimer, in an interesting paper on the diversity of soil adapted to dairying.

THIRD DAY.

The Convention met on Thursday morning, and after some routine business had been disposed of, Mr W L Hunt, of Rouse, read the following paper on

Creameries.

The first step towards the true solution of a problem, is to ascertain where the difficulty lies. But if any one should enquire if some plan to prevent all loss during the handling of a curd had been found successful, the answer would be in the negative. Still, the waste may be rendered very much less, and in an age like the present, in which there is such an imperative demand for money for the pocket of the farmer, with which he must pay for his land, educate his children, and raise himself higher in society, the most trivial loss may, and should be carefully looked after; and no apologies need be offered in attempting to show that more money will return from a given quantity of milk by removing part of the cream, and manufacturing both butter and cheese from the same milk, than by any other method with which we are acquainted, except the manufacture of condensed milk, while the cheese does not lose near as much in value, quality and richness as is commonly supposed; which fact has led us to think a saving is really effected when the cream on the night milk is removed for butter One-half of the whole milk is usually delivered in the evening, and being placed in our milk vats, will, under ordinarily favourable circumstances, yield, as an average amount for the whole season, 2½ pounds of butter from each hundred of milk, by being set for the cream from 9 o'clock in the evening until four or five o'clock the following morning—the milk being in the meantime perfectly at rest, and every facility afforded the cream to rise We will assume this to be the only mess from which cream will be taken, and we have now from the night mess removed 80 pounds of butter and replaced the butter-milk, the whole amount to be manufactured into cheese, with the morning milk, on its arrival at the creamery. We have removed from 8,000 pounds 80 pounds of butter, which leaves the fluid still rich enough to make a pound of cheese from ten and one-half pounds of milk (a long season requiring less, and a short season more milk), or 686 pounds of cheese. Our butter and cheese will bring, clear of expense of making, 30¢ for the former, and 10¢ per pound for the latter, or a total of $92.60, as a net result from the milk The same quantity of milk manufactured into cheese exclusively, will give a net sum from our sales of $80 00, a balance in favor of butter and cheese against cheese alone of $12 60 per day, or nearly $100 per month. This my experience assures me is not a fancy sketch, but is rather under than over drawn. This yield of butter from the night milk is a fair average for six months, May and June yielding more, and July and August may give less than this The removal of this quantity of butter does not materially change the quantity, or the quality, of the subsequent product of the milk. If the cheese is well made, the purchaser will be usually unable to detect any very material difference in the quality. I can only account for this by assuming that we have saved from the milk a large share of the waste by ordinary handling, and partly by a lack of nicety of discrimination on the part of the professional cheese-buyer. It is in most creameries a question whether the butter-milk should be returned to the vat or thrown away. This should depend on its sweetness and flavor, which is usually good in spring and fall, but in hot weather will require the utmost skill and care on the part of all who handle the milk to preserve it good. As a rule, it should be returned to the vat for the manufacture into cheese, not alone, but with the remainder of the milk. It is economy to do so. It contains the same amount of nitrogen as new milk. It does make a larger quantity of curd, but does not improve its quality. Each butter globule has in a natural state a coat of albumen as claimed by some, of caseine by others, which is beaten off in the process of churning. If it is the latter, we may have as much curd minus the butter, of which some always remains, as from new milk. It probably has the value of skim milk. It is profitable to use it, and should be divided among the vats as evenly as may be convenient. When a large quanty is placed in a vat, containing sweet milk, the curd is found to be unusually tender, and with more than the usual waste of curd When, on the contrary, but a small quantity is placed in each vat, from which the cream has been removed, the whey is unusually clear and free from particles of curd. In order to achieve the best results, a fair share of intelligence and energy is required. How the milk should be set for the cream to rise, is a very important matter, and will be most carefully looked after in a well conducted creamery, when, as is usually the case, it is desired to get the greatest amount of cream in the shortest time. The patrons should be taught to bring their milk early in the evening, and it certainly is for their interest to do so The Chenango pan, or something similar, is more economical of time in raising cream, more labor-saving, and far preferable to pails, or, indeed, to any utensil for simply raising cream. Our cheese vats make an excellent substitute, however, and will answer every purpose when it is wished to skim the night mess only. From twelve to twenty hundred may be placed in a vat, and even more, liable only to the objections urged against pails, that the milk is too deep for much cream to reach the surface, and would, in this case, occupy too much time in cooling If too shallow, we shall be annoyed in removing all of the cream. On its reception at the factory it should be placed immediately in the vats, and cooled to a safe temperature as soon as possible, after which it must remain perfectly at rest in order to achieve the best result. The most favorable temperature is from 62 to 68 degrees While the ventilation should be free and thorough, no currents of air should be permitted to ripple the milk, nor should odors be wafted, gently, or otherwise, through the building The milk should be left at rest as early as possible, in the evening, and remain undisturbed as long as can be in the morning The cream is usually thin in its consistence, and always requires an unperforated skimmer in its removal. An ordinary curd scoop made long and wide, with high sides, and having the handle inverted in the back at an angle which will keep the operator's hand out of the milk, makes a good skimmer. The operation should be conducted in a manner which tends to leave the vat as undisturbed as possible. Some persons will get from ten to twenty pounds more butter from the same vat than others can, by reason of the care and skill shown in the act. Cream should not be allowed, from carelessness, or laziness, to spill from the skimmer into the vat, and the surface of the milk should remain without a ripple until the operation is over. When the buttermilk is returned to the vat, the churn should be started very early in the morning, and the last churning finished by the time the morning mess is all received, so that the vat need not be delayed by the churn. The annattomo should be prepared of uniform strength throughout the season, and it will be found accurate and convenient to have a graduated glass beaker for measuring out the fluid, and use a certain definite quantity for every hundred, or fraction of a hundred pounds of cream. The temperature of cream should be brought by the liberal use of ice, during the greater part of the season, as low as forty-eight degrees Fahrenheit, as it is found that more and better butter is gained by as low a temperature as this, than by a higher one. The mass will increase in heat by the friction consequent on the motion of the cream against the side of the churn, several degrees. At this temperature one hour will be occupied in the process of churning, and the motion will even then need to be very rapid.

The churn should be large, that the cream may have room to swell, and some space left, and the nearer air-tight the better. The motive power may be either water, or steam; any one who has used the latter for churning will be convinced of its superiority to the former There should be plenty of power; an engine of three-horse power would be sufficient for most factories. When the grains of butter first began to show, the motion should be gradually reduced until the churn is completely stopped, at which time butter should be in lumps the size of an egg. If the operation is conducted too long, the butter becomes mashed, and salvy, and the delicate grain is gone entirely past recovery. Butter is made good or bad in the churn. It may be spoiled in working, while poor butter cannot be made good by subsequent management. The butter is usually salted when taken from the churn at three-fourths of an ounce to the pound. In working the butter, to remove the buttermilk, a square strip of new soft cheese bandaging should always be used to soak up the milk. It saves manipulation of the butter to some extent, effects a saving in time, and leaves the article drier, and in a better state for shipment, and for retaining its good qualities.

At the conclusion the views of members were given, elicited by the paper, after which specimens of sugar made from milk, specimens of artificial butter, and specimens of solid milk and sugar, in the form of a cake, were passed around and examined.

A paper was then read by Mr. Edward J. Wickson, of the Utica *Herald*. His subject was "Feeding at a Mark," and the address was illustrated by an ingenious diagram in colors. The effort was well received and favorably commented upon.

FINAL SESSION.

When the Convention assembled Mr. G. V. H. Scoville offered a resolution, which was carried unanimously, that when the Convention adjourned, it adjourns to meet in the city of Utica on the second Tuesday in January, 1875.

Mr. Blanding, after some introductory statements, spoke as follows on

Curing Cheese.

Mr. President and members of the Association:—I feel incompetent to treat the subject before us, with the thorough practical knowledge which its importance demands, but will throw out some suggestions, as they appear from my standpoint, as a cheese manufacturer. I believe that much of our cheese composed of good stock and well made, is seriously injured in quality by improper and imperfect curing, For the truthfulness of the statement, I would refer to the experience of a large majority of cheese manufacturers in all our dairy section. The annoyance and perplexity to which they are subject, with the improperly constructed and enclosed curing rooms, especially for the early and late make of cheese. The unsatisfactory condition of a large part of this class of goods, when ready for the market is, a constant source of anxiety to the maker, who desires to excel in his or her profession. Our climate is so uneven, with such constant reversions of heat and cold, and cold and heat, it becomes difficult to secure those favorable conditions, by which curd is changed to cheese. This difficulty is referred to in a letter from John Merrell & Co., of Liverpool, to our former secretary, in which they say: "You require to be most particular in the construction of your factory building, so as to secure, as far as possible, an even temperature. In this respect Mr. Morrell, when in the United States, found great fault with many of your factories; and until these deficiencies are overcome, it will be quite impossible to prevent some of the defects in your cheese, such as porous, and bad keeping qualities, which are both caused in a measure by unevenness of temperature. Many of your friends know by experience that these faults are a great drawback on goods for this market; and, until your association remedies this, your factories will do well, as a rule, to sell, or ship their cheese as soon as ready, as the depreciation in quality, loss of weight, and interest of the money, will rarely

be compensated for, except the advance in price is very great."

From the judgment and conclusions of such men as we have quoted, being sustained by our own experience, it seems that there is a large loss to our dairymen by not providing rooms properly adapted for curing their cheese. The manufacturer has much to contend with. He receives milk, some in good, indifferent, and bad condition, sometimes already impregnated with the seeds of putrefaction and decay, and sometimes reeking with an abundance of animal odor; and his skill is taxed to its utmost capacity to manufacture a prime article of goods. He succeeds in a fair measure, and places his cheese on the shelves with a sigh of relief: but soon finds his work is not yet accomplished. He turns, and rubs, and greases his cheese, while the cold winds, and rains, and perhaps snows, of early spring and winter howl defiance at him through every crack and crevice of the rickety and barn-like curing-house. Some manufacturers seem to think that their care, anxiety and watchfulness ends when the cheese goes to the press. After that, the cheese will almost take care of itself; but with good curing-rooms fitted with all the appliances of artificial heat and thorough ventilation, much care must be exercised in the treatment of the cheese on the shelves. We have witnessed in our own experience 10 per cent. gain in quality in the same goods, by extra care of the cheese while curing. Therefore, let this Association, through its officers and members, urge upon the stockholders and owners of factories, the importance of suitable curing-rooms, with the necessary heating and ventilating apparatus, so that in the curing, as well as the making, we may secure such goods as shall not only be sought after in our own and European markets, but acknowledged by all as the best in the world.

Mr. B. B. Moon, of Herkimer read the closing papers of the session, which was upon "Sunday Cheese Making."

The Committee on dairy apparatus and products presented their report.

There was some denunciation expressed by several members against the quality of Onondaga salt, which was not at times up to the standard. The manufacturers could make a good salt, if they choose, it was claimed, but they did not always choose to do so.

Mr. O. S. Bliss invited the members of the Association to meet with the Vermont Dairymen's Association at its Convention. After which the Convention adjourned.

Profits from twelve Cows in one year.

My cows are all breeds, a mixture of natives, Devons, Durhams and Jerseys. It took for a pound of butter in June, twenty-two pounds of milk, the last of summer about 21. I now make a pound of butter from 20 pounds of milk, and skim it 26 to 28 hours after straining. My account for the year stands as follows:

	CREDIT.	
Sold 2450 lbs of butter for	$1112 02	
Used in family 150 lbs. worth at	65 10	
Sold calves, pigs and pork	1[illegible] 00	
Pork salted 500 lbs. at 7c.	35 00	
Killed one calf worth........	[illegible]	1377 1[illegible]
	DEBTOR.	
Cost of meal feed to cows	$127 00	
Cost of meal feed to hogs	10 00	
Paid freight and express on butter.	60 00	267 00
		$1110 12

Leaving $92 50 per cow to pay for work, hay and pasture. Now let us hear from the farmers and know what each other are doing. As dairymen can not get far from home very often we must talk through the papers.

S. C. Drew in Vermont Farmer.

DRYING COWS.—Great care should be taken in drying off cows. Don't trust to the advice of some, and allow the cow to dry herself off when you do not wish to preserve the milk further. Every few days draw all the thick milk; allow none to remain. This is often the cause of the loss of a portion of the udder, and the multiplication of three teated cows, which is equivalent to loss of the cow for profitable milking.—*Live Stock Journal.*

AVERAGE MILK TO A COW.—At a meeting at Jamestown, N. Y., several dairymen agreed that 150 pounds of butter per cow per year was about the average product of dairies generally. The largest yield reported by any one present was 309 pounds from three cows selected from fifteen, and had 200 pounds per cow for his dairy. One with dairy of 20 cows, had the following average for past four years: 175, 160, 156, 146 pounds. Another dairy of seventeen cows had this year given more than 200 pounds each.

Poultry Yard.

Poultry Notes—No. 3.

Mating for Domestic Purposes.

Poultry-breeders may be divided into two distinct classes, the one a breeder of fowls for their economic, the other for their exhibition excellencies, and both for profit. These two classes might be again subdivided into others, but for the purposes of this paper the two divisions above named will be found sufficiently practicable. Under the first of these classes may be ranged the farmer and poulterer, whose chief object is to produce large marketable fowls, and early and easily matured chickens, fowls that require little care, are easily fatted and when killed will make excellent table birds; chickens which grow fast, mature quickly, and will bring the breeder a good price in the market. Under the other class we may include the amateur and fancier, who breeds for exhibition purposes chiefly, yet all the while keeping steadily in view the two other objects sought to be produced by the farmer and poulterer, size and maturity. Imporant as these two things are to the breeder of exhibition poultry, there are others of still greater importance. He seeks in addition to produce points of utility and fancy, in accordance with an arbitrary standard, an ideal of his own creation, or rule laid down by others for his guidance. It will be seen, then, that while the motive which actuates both is different, the object sought to be obtained is common; that while the fancier and amateur may, and does, secure all that the farmer and poulterer can obtain, the latter can never secure the high object attained by the former. There is however one starting point common to both, that is the ages of the birds which are to be bred together; whatever be the object let it be remembered that cocks and hens in their second year will always breed well together, and the chickens usually fledge better than the produce of either older or younger birds.

The first point for consideration, then, will be the subject of mating fowls from the farmer's point of view, or for the production of large sized and easily matured chickens, regardless of exhibition or fancy points. This can but be obtained by systematically crossing pure-bred poultry of one breed with that of another, but different variety, and the knowledge of which breeds when so crossed will produce the best table fowl and most economical, form one standpoint we will now endeavor to illustrate. The produce between dark Brahma hens, and a Dorking cock is a very excellent one, very large and truly magnificent fowls are obtained, the largest perhaps that have ever been raised; chickens thus bred have at six months old weighed over 18 lbs. the couple, a weight rarely if ever attained by any other cross, besides which they fledge kindly and mature early. By crossing the pullets or hens of this mixed race again with the Houdan cock, chickens are obtained, which though less in ultimate weight than the half-bred Dorking, attain a still earlier maturity, and may be killed at ten weeks old of very good size. Both these crosses are well worth the attention of the farmer, but their merits should be kept up by continually using the blood of good and pure stocks, else the result, unless great judgment be exercised, will be disappointment and deterioration. Again, Brahma hens mated with a Creve-Cœur cock will also produce an excellent cross; they are hardy and easily reared, and attain to great size. The flesh is of a delicious flavor, and fully equal to that of the Dorking, while at the same time the fowl is free from that very delicate constitution which often renders the latter an unprofitable bird. Then again, the chickens produced by mating Cochins with Creve-cœurs, LaFleche and Houdans, are all remarkable for the rapid growth and great size they attain. Chickens produced in this way, and raised in the month of March, have at twelve weeks old weighed from four to five pounds each and at six months cockerels off the run have weighed as much as seven pounds. The produce of a Cochin hen mated with a Creve-cœur or LaFleche cock, cannot be too highly recommended; the chickens as already stated will be of rapid growth, large size and great constitutional vigor, and when cooked for table will be found plump, with skin and fat much whiter than the Cochins. Farmers desirous of producing early market chickens would do well to cultivate this cross freely.

Thus far we have only mentioned such mating as would produce good table birds, regardless of their laying qualities, although it ought not to be overlooked, that all crosses with a Brahma hen produce good laying fowls; yet for this purpose there are some crosses better than others. The chickens produced by mating a Brahma hen with a Spanish or Minorca cock will generally be black on the body, with dark striped hackle, but which for average fecundity surpasses any and every fowl we know, whether the same be a cross bred, or a pure bred bird.

Frequently breeders find it necessary to increase the size of a fowl, or to make hardier birds by the infusion of new blood; this may be done successfully by mating a Dorking hen with a Cochin cock, which may be done as follows. In the beginning of the year, put two or three large Dorking hens with a short-legged compact Cochin cock, either of the common buff, or partridge variety; of the chickens of this cross choose those those pullets which possess in the highest degree the Dorking character, viz.:—fine bone, short white legs, and compact body, and square on the limbs; the following season mate them with a good Dorking cock, the result will be three-fourths Dorking, which if care has been taken in the selection will show very little trace of the Cochin descent, while the size and constitutional vigor of the birds will have been much improved by the infusion of new blood. But these birds must not be permitted to breed among themselves, else they in all probability will revert to the Cochin type; the pullets must be again mated with a Dorking cock. This and all similar crosses, as we may have occasion to note hereafter, is based upon the principle that in cross-breeding, the pullets usually are like the mother, and the cockerels like the father.

There are other crosses which it is not well to adopt, and to which we think it well to direct the attention of breeders. A cross between a Cochin and a Spanish is not a desirable one. The Spanish is a long-legged bird, Cochins are also inclined in that way, two characters very undesirable to be perpetuated, but which will never fail to be re-produced in the offspring of these parents. By mating Cochin hens with Poland or Hamburgh cocks, the produce will be a short legged compact fowl very useful as sitters, although the sires are of the non incubating varieties. The cockerels are of course useless for stock birds, but will serve to supply the kitchen.

It is the belief of some persons that crosses are always better than pure-bred fowls, and acting on this idea never admit pure breeds into their yards, but this is an error which we hope some day to see entirely discarded. The result of crossing when judiciously managed has, no doubt, resulted successfully in firmly establishing new breeds, two notable instances of which we may mention as having occurred in England, the Sebright Bantam, and the colored Dorking, but then it was carried out scientifically and with one object only in view. We mention the colored Dorking, because it is now a well admitted fact that this variety was the result of a cross between large Surrey or Sussex hens, and the white Dorking cock. Another fowl worthy of mention, also the production of a cross, and nearly perfected by our American breeders, is that of the Plymouth Rock a bird highly spoken of by those who have bred it.

But the really practical benefit to be derived from cross-breeds is that already mentioned as beneficial to the farmer [in the production of large and easily raised chickens for table.

Keeping Poultry Pays.

A correspondent of the *Massachusetts Ploughman*, says:—

"If not for the hens we should be in the poor house—we did our level best last year with crops and barely made both ends meet

We are not discouraged under the most discouraging circumstances, and if I succeed the coming season, as I expect to, I shall gave to the readers of the *Ploughman*, the most astonishing account of success in farming under difficulties they ever read.

We sold this day sixteen dozen eggs for eight dollars. These eggs were from forty-five laying hens in the last week. These were hatched out last march their quarters are above ground, light, dry, and airy sheltered by house, barn, and high board fence, from all winds except south and south-west. Their food is a variety; at break of day a warm mess of six parts of shorts, one part meal, at noon meat of any kind, with a little tallow of some kind, chopped fine at night corn, no more at either meal than they will eat greedily. We keep by them all the time pure water (warm very cold mornings), slacked lime ground oyster shells, oats, cabbage, wood ashes, dry sand and gravel, also from time to time cayenne pepper and salt mixed in the meal in the morning also now and then buckwheat, barley, and rye as dessert. Our flock numbers seventy, the non-layers being old hens moulting and young pullets about half and half.

We don't believe in keeping hens over, except a few choice fowls to breed from. We don't believe in chickens hatched after April, we believe in having plenty of eggs from the middle of October during the months following when eggs are high.

We don't know of any one successful among all our friends having, altogether, hundreds of fowls except by obeying essentially the above particulars We are not particular as to breed, except we want large lively hens. We change cocks every year and look for good sized smart fellows.

We love our hens, keep their house clean, and save their droppings as the best fertilizer on the farm There is no other interest on the farm we would regret to lose so much as this, as it pays. If my flock do in proportion to what they did last winter, we shall be getting in a week or so, from thirty-five to fifty eggs a day,—at from forty-five cents to sixty per dozen, this will do."

THE FIRST POULTRY FANCIER.—If we consider the peacock to be really meant (in 1 Kings, x. 22), all difficulties appear to vanish. There are some indications which may point to Ophir, being in the East Indies, as, for instance, that the natives of Malacca still call their gold mines *ophirs* (De Poivre); but one of the most singular, and more connected with our immediate subject, is, that in Malabar the peacock is still called *Togei*. and in one of the Indian dialects *Tikki*, which may furnish a very probable deviation for the word *Tukiyyim*. On all these, and other grounds, it is now considered far the most probable that Solomon was really nearly, or quite the first to import this beautiful bird from the East, and that some southern region of the Indies—it might be India itself, or Malacca, or perhaps Ceylon—was the locality from which they, and the other precious products enumerated, were procured. The few lines we have devoted to this curious subject will hardly be considered as wasted, if it be remembered that such conclusions—supposing them to be correct point to Solomon as *the first importer of fancy poultry*, and singularly enough, from the very same region whence the most striking of our own more moderate varieties have been obtained So curious an idea may be smiled at, and perhaps be even classed with the familiar assumption regarding the same monarch being "the first free mason;" but in this case, we have, at least, a fair amount of solid evidence in favor of such an honor and antiquity for our noble craft.—*Wright's Illustrated Book of Poultry.*

I HAVE found that the white sweet swede turnip is good for big chickens—cooked, and then mashed, and mixed with about an equal amount of corn meal. Mix it so that it will be as near dry as you can. The same when you mix a potato mash—mix it too thick to pour Potatoes cooked and mixed with corn meal I think cannot be beaten to feed to laying hens.—*Cor. Country Gentleman.*

The Apiary.

Bee-Stings.

One of the most formidable hindrances to the extension of bee-keeping, is the fear of being stung If you suggest to any one well situated for the purpose, the advisability of starting an apiary, most likely the objection will at once be made, that the wicked little creatures are so mischievous with their stings, that there is no desire to have anything to do with them. The impression many people seem to have, is that the chief mission of the bee is not so much to store honey, as to sting all and sundry. Bee-keeping will always be confined to a select few, until popular mistakes are corrected, and more light is diffused in regard to this affair of stinging.

As a matter of fact, bee-stings are "like angels' visits, few and far between." It is only now and then that any one is punished thus, even in localities where large numbers of bees are kept. When it is considered that ordinary colonies contain twenty or thirty thousand bees, and that the population of, say forty hives, is about one million, it must be evident that stinging is a rare and exceptional thing, and that so far from its being the chief business and constant aim of these insects, it is very seldom resorted to. Were it otherwise, and as too many unreflecting persons think; were bees as apt to sting as mosquitoes are, it would be absolutely impossible to keep an apiary.

All creatures have means of defence furnished them adapted to the repulsion of those enemies by which they are likely to be assailed. Self-preservation is the first law of nature. Man is the chief enemy of the bee. Though this busy little worker is intended to do important service for the human race, it must have protection against the very beings whose interests it is meant to serve. If bees were as harmless as flies, no honey would be stored for the use of mankind. Their operations would constantly be interfered with. Every school-boy and little child would do "meddle and muddle," that the order, discipline, industry and usefulness of the hive would be destroyed. The sting is therefore a beneficent provision of nature, without which the bee could not accomplish its mission or fulfil its destiny. Some exceedingly scientific apiarians, indulge the dream of being able some day, to breed out the sting, or at any rate, the disposition to use it. Whether this dream will ever be realized, is a very doubtful matter, and whether its realization would, on the whole, tend to advance the interests of bee-keeping, is perhaps even more doubtful.

Some people affect to despise a bee-sting. We do not. A bee-sting is no joke under any circumstances, and under some circumstances, it is a very serious and painful affair, as we can testify from personal experience. In parts of the human body, where there are important blood-vessels and main lines of nerves, near the surface, causing the poison to act quickly and spread rapidly, a sting is something dreadful, especially if inflicted at a time when the virus injected is more than usually powerful. For it is well-known by experienced bee-keepers, that the poison is more virulent at some times than it is at others. We were once stung in the central point of the upper lip. The poison took immediate effect, and spread with astonishing rapidity, upward to the head and downward to the throat and stomach. The pain was excruciating Sickness, burning fever and various alarming symptoms quickly resulted. It was three or four days before the effect of that one sting passed off. There have been cases in which a single bee-sting has caused death. It is therefore no sign of wisdom to ridicule the matter, but rather to estimate the thing as it really is, and endeavor to guard against it.

Intelligent acquaintance with the habits of the bee, and the use of proper precautionary and remedial measures, will either prevent stinging altogether, or secure immunity from serious and fatal consequences.

In the first place, it should be distinctly understood, that when bees are out foraging, they are too intent on their work to sting, unless they are interfered with, fought at, crushed, or made fast in some way. If human beings would mind their own business as diligently as the bees do, it would be well for them. Quarrels and disagreements would seldom occur. It is perfect folly to start with affright at the presence of a bee. The music of their industrious hum as they fly from flower to flower, loading themselves with honey, should no more awaken fear than the noise of a loom, a spinning-jenny, or machinery of any kind. If you meddle with the works, you may be hurt, and the same is true of the workers. But let them alone, and you are safe enough in both cases. Nor is there usually any danger in quietly watching bees as they issue from and return to their hive. The stupid practice of hurrying about and striking at any bee that may happen to come near, is a sure way of exciting anger and provoking the infliction of a sting. Quiet movements, avoidance of all striking, standing stock-still, with the head slightly hung down, if the bees exhibit any signs of excitement and anger, will secure exemption from all harm. Even if pursued by enraged bees, gliding into a thicket of bushes, and remaining there a few seconds, will be found a sure means of escape.

The utmost liberties may be taken, and the most delicate operations performed among bees, with due care and precaution. As they are excessively nervous and irritable creatures, nothing should be done in a hurry. All sudden jars and rude movements must be avoided. They must be dealt with most gently and tenderly. The use of smoke is an effectual means of subduing and quieting them. It will prevent their becoming excited, and reduce them to composure even after excitement has commenced from any cause. Any description of smoke has this effect upon them. Bee-keepers who smoke tobacco, are accustomed to employ the fumes of their favorite weed for this purpose, and it accomplishes it very effectually. But it produces a stupifying and irritating effect afterwards. Smoke from chips, sawdust, cotton rags, or even paper, will answer as well. The most convenient source of smoke is a bit of dry-rotted, hard wood, or "punk" as it is sometimes called. It burns without flame, will keep alight until wholly consumed, may be laid close at hand, and readily used whenever wanted. When there is a necessity for opening a hive, it is well to blow two or three puffs of smoke in at the entrance; within five minutes or so, it will have taken effect. Then with slow and cautious movements, the hive may be opened. Usually a quiet, contented sort of a hum, will show that the inmates are peaceable. But if there is excitement and more or less rush hurriedly out, a few additional puffs of smoke will reduce them to submission, so that it will be safe to proceed. Care should be taken not to crush or kill any of the bees. The slaughter of a single one will sometimes enrage a colony, previously quite docile. But should such an accident occur, a fresh dose of smoke will restore order.

Smoke is thought to have two effects. First, it creates a slight panic among the bees, leading them to fill themselves with honey, and in this condition they are no more disposed to sting than an Englishman is to quarrel just after eating a good dinner. There is a sense of fulness, contentment and satisfaction. Secondly, it neutralizes the poison-odor. Anger causes bees to elevate their tails, and a tiny drop of poison will ooze out, the odor of which rouses the war spirit. The same effect is produced when a bee is killed. Smoke counteracts this odor, and so induces quiet. There is a third effect of smoke which may be brought about, though it is not good policy to have recourse to it, because it leaves them cross and irritable. A strong dose of tobacco, or

puff ball smoke, will absolutely stupefy them, so that they will drop from the combs, and lie harmless and helpless at the bottom of the hive, until restored to their senses by fresh air.

Bees employ a substance called propolis to fasten frames and fill up crevices in the hive. In hot weather this is quite soft and waxey, but in cool weather, it becomes hard and brittle like glue. In opening a hive and taking out the frames, the propolis is of course disturbed, and when it is hard, this cannot be done without some jarring. To avoid this as much as possible, it is advisable to use a form of hive and style of frame that can only be glued very little; and also to open the hive and operate upon it in the middle of the day, and when the weather is warm.

We advise bee-keepers and especially beginners, to use a veil and gloves. They give confidence, induce calmness, and guard against accident. A veil may be readily made of net or thin gauze, and the best gloves we know of, are the cheap harvesting ones made of sheep-skin to protect the hands from thistles.

Various remedies are used to antidote bee-stings. Any alkaline application is good. Common washing soda and blue-bags, are generally at hand, and may therefore be recommended. A drop of honey, a little garden soil, spirits of hartshorn, alcohol, and tincture of iodine, are among the external applications advocated. In severe cases, a dose of whiskey or brandy is said to be good. A wet sheet pack is also recommended. But we have discarded every other application since becoming acquainted with a German remedy lately introduced by Mr. W. S. Hawley, of Utica, N. Y. A drop or two will remove all trace and effect of a sting in a very few minutes. It costs but a dollar per bottle, and a single bottle will last a bee-keeper for a lifetime.

Miscellaneous.

City Manners.

The Louisville *Courier Journal* relates the following anecdote, as illustrating the manners of the inhabitants of that city :—

A few weeks ago, a man from the country settled in the eastern portion of the city. As there was plenty of grass in his front yard, he frequently took a basin, and a pair of scissors and cut some of the grass for his chickens. The following statistics show the singular interest excited among passers-by, who saw him at work :—

Number of persons who stopped, and stared,	24
Small boys driven off the fence....	49
Persons who asked, "Isn't it purty late to be cuttin' grass ?".....	18
Persons who asked, "Don't ye want to get that grass cut ?"..	7
Persons who asked, "What ye cuttin' that grass for ?"..	12
Persons who stared without stopping.....	167

The man has made up his mind to return to the country.

Brain Work on the Farm.

As an element of success in making the farm pay, a mind having a good practical turn, plays no unimportant part. Good, sound common sense will do more than any one thing to put money in the farmer's purse, or, better, put it in permanent improvements. Fixed, and definite line of action, founded on the experience of the most successful farmers in one's county, will, with due diligence, and economy, result in making the farm pay. As a rule, the farmer who thinks, studies, reasons, and who can tell why he pursues a certain course, is the one that will be found to complain least in regard to hard times. If a man who has good health, and fair ability, cannot succeed on a farm, he will be almost certain to fail if he attempts anything else.

Farmers should have an eye to business. The writer of this has often been impressed with the belief that the most successful farmers are those who lie awake and mature plans for the coming day, or week, while others sleep. There is a great deal in fact, but there is also a great deal in letting the brain do its share of the work. The farmer who will never think that it is better to feed his corn to stock, and thereby increase its value three-fold, than to haul it to the station in the car, and sell it for almost a song, should not expect to succeed.—*Colman's Rural World.*

Advertisements.

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