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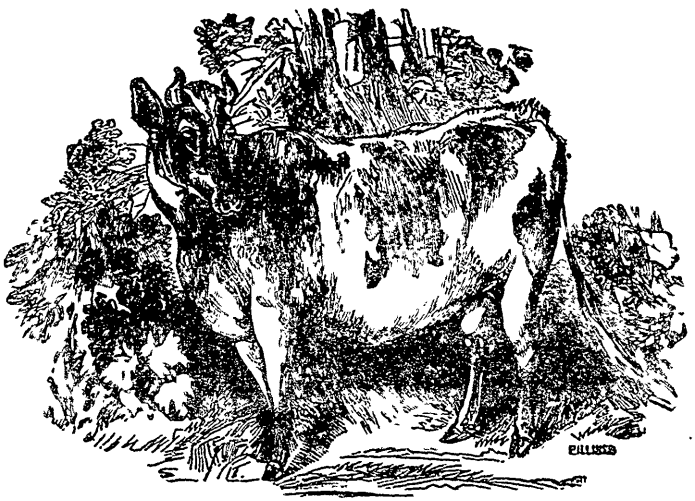

The Alderney or Jersey Cow.

The breed of cattle, termed Alderney, has been known as belonging to the Channel Islands, a small group which lie near the shores of France, but pertaining to the Crown of England, being the sole remaining appanage of the ancient Duchy of Normandy.

For many years large numbers of these cows have been exported to England, where they are much esteemed for the peculiar richness of their milk, and the large amount of excellent butter which it yields. The breed somewhat varies in the different islands, but the animals belonging to may be generally described as small and ill-formed, particularly in reference to fattening. In this respect they exhibit a striking contrast to the larger and more widely diffused breeds, such as the Durham, Devon, Hereford, &c., &c. "The cow is greatly below the male in strength and stature: her neck is thin, her shoulder light, her chest narrow, and the belly large. The limbs are slender, the pelvic bones prominent, the lumbar region is deep, the croup short and drooping, and the udder large. The muzzle is narrow, the horns are short, slender and curving inwards. The colour is usually of a light red or fawn, mixed with white; but frequently

individuals are black, mixed with white or dun, and sometimes cream-coloured. The skin is thin, and of a rich orange colour, and the fat, as well as the milk and butter, is tinged with the same colour. The animals are gentle, and somewhat delicate in constitution. Being small in size, the milk they yield is small in quantity, although fully in proportion to their bulk of body; and it is viscid and exceedingly rich in cream. In their native islands the steers are used for labor, to which they are better adapted than, from the slender form of the dam, might be inferred."

In these rich and picturesque islands land, according to French customs, is very much subdivided, and the agriculture resembles in many respects that of Belgium, that is, very garden-like. "The cow, in an especial degree, is the subject of the care of these island farmers. She is penned in a narrow space, and shifted to fresh spots of herbage several times in the day, and in the nights of winter she is warmly housed, and, when about to calve, is nourished with cider. Through all the year these little cows are to be seen in their patches of meadow, often under the shade of the apple trees, and so fastened that they cannot raise their heads to pull the fruit. In addition to their herbage, they are fed with lucerne, clover, carrots, parsnips, and the large Jersey cole, the leaves of which are stripped off as they grow. A value is here attached to the cow greater, perhaps, than in any other part of Europe. She is the resource of the household for food, and her surplus produce is a part of the returns of every farm. A Jersey man, it is said, will treat every animal on his farm with neglect except his cow. To preserve the purity of the race, an act of the insular Legislature was passed in the year 1789, and yet subsists, by which the importation into Jersey of any cow, heifer, calf, or bull, is prohibited under the penalty of 200 livres, with forfeiture of the boat and tackle, and a further penalty of 50 livres is imposed on any sailor on board who does not inform of the attempt. The animal itself is to be immediately slaughtered, and its flesh given to the poor."

The island of Alderney is too small to allow of any large exportation of these animals, the principal part of which come from Jersey, which exports about two thousand annually. These are the small, fine, and handsome sort, the favourite colours of which are the dark tan, and the lemon and white. The *Guernsey* cow is larger, coarser, and hardier, but there is not that dependence on the purity of the breed as in the Jersey cow. In Jersey, as before mentioned, no other animal is allowed, upon any pretence, in the island; while in Guernsey the law is not so stringent. Then the *quality* of produce is believed to be better in the Jersey than the Guernsey.

A recent writer of high authority remarks as follows:—"All Channel Island cows, and also very many from the adjoining coast of Brittanny, are sold in England under the general name of 'Alderneys.' There seems to be important differences between the cows of the different islands. Those which are really bred in Alderney are the smallest,—then the Jersey ones; the Guernsey animals are the largest. There is a great jealousy between the islands about the superiority of their own cows. The Alderney people stoutly maintain the superiority of the animal which has (rightly or wrongly) given a name to the breed; whilst the contest between Guernsey and Jersey rages on hotly upon this moot point as upon many others. Whatever may be the rights of the question, however, it is certain that Alderney can spare very few cows for exportation. There are not 400 head in the island, and the number annually spared from this stock is under fifty. Jersey exported 1,138 cows and heifers in 1860; Guernsey not half that number. Many cattle are shipped at Brittanny, and the skippers, calling at Jersey or Guernsey upon some pretence to get customs' papers there, bring their live stock on to England, and sell them for Channel Island cattle. This is a fraud, for they may be bought in Brittanny at from £4 to £5 a head, but a genuine Alderney will fetch from £14 to £18. In spite of the enthusiasm with which the merits of the Alderney cow are supported by her admirers, there are some who maintain that in-and-in breeding has done its work in effecting a deterioration of the animal. They point to the fact that in Alderney, where the purity of the breed is most conservatively kept, the animals are smaller. They declare that in Brittanny, where the system of in-and-in breeding, a race of diminutive cattle has been obtained still smaller

than the Alderney cow. As for the superior productiveness of the breed, they maintain that it does not exist, or that at least it is the result of constant pampering, such as would be quite inconsistent with an extended system of agriculture. Arguing in this way, they conclude the main merit of these cows is that they are beautiful little animals, whose chief attraction consists in their comparative scarceness; and that the high price which they fetch is due rather to a fancy than to any accurate valuation of their intrinsic worth. These opinions must be heretical to patriotic Channel Islanders, and are recorded, not because we agree with them, but because we have heard them upheld by persons who seemed entitled to attention. As for the charge of 'pampering,' one farmer's wife recommend a little cider to be mixed up and baked with bruised beans as the cow's food. In her opinion, it made them eat more heartily."

We are not aware that any of the Channel Island breed of cattle has been introduced into Canada, and but few, we believe, have found their way, as yet, into the United States. The cut prefixed to this article represents a cow imported from the island of Jersey, by Mr. Rowsell Colt, of Patterson, N. J. In England, these cows are principally confined to small dairies, belonging more particularly to amateurs or private gentlemen. One Alderney only among a dairy, or three or four cows, is found to materially improve the quality of the milk and butter. It is this tendency to convert the far greater portion of the food which they consume into the richest milk, that renders them so difficult to fatten. They are well worth a trial in Canada by private families who feel a special interest in the quality of the milk and butter which they consume; but great attention would be required during the severe weather of our winters with regard to feeding, cleanliness and protection.

Alsike Clover.

[From the *Irish Farmers' Gazette*. The Alsike is generally approved of in Canada, when it has been fairly tried.—Ed.]

Alsike clover (*Trifolium hybridum*), though introduced into the British isles nearly a century ago, and re-introduced several times since, has made but little progress in general cultivation as a forage plant. For many years it was only cultivated as a curiosity in botanical collections, but for some years back it has engaged more attention amongst the more enlightened of our agriculturists: for this purpose it has been cultivated from time to time by several; but from inattention to its *habitat*, so as to develope its excellencies, it has just as frequently almost been thrown aside, as not fulfilling the expectations formed of it.

It enjoys the name hybrid from the intermediate resemblance it has to the common red clover, *Trifolium pratense*, and white clover, *Trifolium repens*, which has given the idea that it is a hybrid or mule produced by a union between those plants, but in reality it is a perfectly distinct species from either, for though *Trifolium repens* and *Trifolium pratense* have been growing in close proximity for ages past in the British isles, there has been no instance on record where this species has been found or discovered in these countries. This fact, in our opinion, amounts to proof-positive that the plant in question has not been produced by hybridization, but that it is a perfectly distinct species.

It is reported to grow wild in Finland, Denmark, Sweden, Germany, France, Portugal, and Italy, and was first found growing with great luxuriance in ditches at Alsike in Sweden—hence the name of Alsike clover, given by some late introducers of the plant. Upon a close examination, it has not the most distant resemblance to *Trifolium pratense*: and it resembles *Trifolium repens* in but a partial degree. Its roots are fibrous and perennial, but the stem is not creeping and rooting at the joints like the white or Dutch clover; neither is the stem erect like red clover, but weak and branching; its leaflets are ovate, and slightly serrated; the flower heads are globular, and fixed on long peduncles; the colour of the flowers whitish and pink; and the seed vessels tetragonal. Having less deeply penetrating roots than red clover, it is not calculated for very dry soils or extended droughts. Being a more permanent plant than red clover, though it does not yield so heavy a crop, it is well suited for sowing in land that has become clover-sick, providing the land is deep and not too dry, its favourite soils being deep loamy and peaty soils, rich in vegetable matter, but stagnant wet is destructive to it. In such soils it grows to the greatest perfection, producing hay of the most nutritious description; retains its leaves, smell, and colour in curing; is reported never to become mouldy; and as either a hay or a green soiling crop is eagerly eaten by all descriptions of stock.

On rich, reclaimed moors or slob lands it is a most valuable plant, being much more permanent than red clover, and yielding a heavier crop than the white species. We saw this exemplified on the reclaimed slob land of Lough Foyle when the Royal Agricultural Society held their show at Londonderry, in 1858, very extensive breadths of it having been laid down

with this plant. It is therefore, highly useful and valuable on such land, producing both a soiling and a hay crop; while the white clover is of too prostrate and creeping a habit to be useful for anything but grazing. On the other hand, on dry arid lands it produces poorly, dwindles away, and finally perishes in drought; while the white clover retains its hold, and though it suffers in thin soils in point of drought, and, to all appearance dies, in very thin soils, it quickly recovers and grows luxuriantly when rain sets in, so that it depends on the judicious selection of the soil whether the cultivation of Alsike clover or any other plant becomes remunerative or not.

We have already stated that it was found growing luxuriantly in ditches at Alsike. This is a good guide to its cultivation, and we may safely infer that such a situation is its natural *habitat*, and that it requires a rich, sappy soil to bring it to perfection, but it must not be wet. On deep, alluvial soils and rich, well drained, moory soils, it is a most valuable addition to our foddering plants; but on high, dry, or thin lands, richly laid down, though it may do well for a time, it will run out and lead to disappointment.

Kohl Rabi.

[This valuable root has been successfully grown in different parts of Canada, and deserves to be more generaly known. It is important that it should receive a fair and extensive trial. The subjoined remarks from the *Irish Farmer's Gazette* will be found interesting and suggestive.—Eds.]

Another farming crop that should be attended to at once, and should be more extensively cultivated than it is, is the kohl rabi. It is a long time since this plant has been introduced into these countries, more as a garden curiosity than anything else; but as a useful feeding plant for cultivation in the farm it has been very tardy in making its way. It thrives in almost any soil and in almost any climate. In India it is in much request as a rich and delicate garden esculent, and in many of the European continental countries it is in high esteem for feeding milch cows and other cattle. It is also most useful for feeding sheep, is perfectly hardy, and stands any amount of frost. It is the only plant that has been found really useful in filling up the blanks amongst swede turnips, and where that crop has been cut off by the fly it is the only plant that gives a certainty of a full crop by transplanting it, which is much better than sowing swedes or any other turnip again. For this purpose it should be sown thickly in beds as soon as possible; the earlier the better, so as to have good strong plants to put out by the end of May or early in June. By giving sufficient space the globular heads produced will weigh from 6 to 10 lb. each and upwards; the rows should not be nearer than 2½ feet, and the plants two feet apart in the rows. They may also be sown in drills any time in May, and treated in every way the same as turnips. Kohl rabi is not only perfectly hardy, but it bears accidental injury better than swedes; for while the latter, when wounded, quickly rots away, the former still remains sound. Experiments have been made by cutting and hacking both kohl rabi and Swedes side by side to ascertain this, and while the Swedes rotted away, the kohl rabi seemed nothing the worse. Hares and rabbits are particularly fond of the kohl rabi, and when found growing in the same field they reject everything else in favor of it while it lasts, as we repeatedly witnessed; and upon our recent visit to Rocksavage, the seat of C. Kenny, Esq., all the kohl rabi then in the fields was completely scooped out. Besides being a very superior farm crop, its leaves as well as bulbs are particularly useful in the kitchen; the former being sweet and palatable, and the latter, when well boiled and well macerated with milk and butter, being an admirable substitute for mashed turnips, and when advanced in the season being free from woody fibre that renders turnips useless as a table vegetable at that time of the year.

The Course of Agriculture in the West.

Causes influencing the Present Prices of Corn—Freights to the Sea-Board—The East may compete with the West in the Production of this Staple—Northern *versus* Southern Illinois—Cotton Growing.

CHAMPAIGN, ILL., Feb. 1, 1862.

As there is an intimate relation existing between the producers of the East and the West it is right and proper that they should be posted as to each other's doings. Within the past few years great changes have been made in the staple products of the country. The whale fisheries once so extensive and profitable, were ruined by the discovery of lard oil, which, by the cheap corn of the west, could be procured at a cost below that of catching the whale; whale stock of the seaboard went down, and lard oil stock of the west went up, and the cornfields had a wider margin. Camphene and fluid, soon after lard oil had, as it was supposed, become the great *light*, yielded to their more brilliant display, and the greasey product of pork again found its level.

But as corn was directly appealed to for *light*, it was a matter of indifference to

western farmer whether it was supplied directly from corn or its product, pork, so long as he held the monopoly of its production. But genius and Yankee perseverance did not stop here; and the coal mines were explored for more light, and they had just begun to yield it in the shape of kerosene, when the discovery of the oil wells burst upon the wondering west. Camphene, fluid and kerosene from coal were at once extinguished by the floods from the oil wells, and corn that had become the great staple not only for food, but light, had to give place in turn to the new power.

While *genius* was busy carving out a fortune for this new product, she was not unmindful of the great staple corn, and by new modes of culture and new implements so cheapened its cost that it retained an important place in commercial circles. Of late, in consequence of forcing a double amount of freight on the northern transportation lines, the price of this staple at the west has gone down below the cost of production, while at the seaboard it commands a pretty fair price. Should this state of things continue, corn will cease to be named among the agricultural staples arriving at tide-water from the west. The present price of corn at New York is sixty-two cents, and at Chicago twenty-two, showing a cost of forty cents for freight, at least double the ordinary rates. The average cost of placing corn in the Chicago market from the country stations is nine cents, that is, eight cents for freight, and one cent for selling. The buyer must have three cents for buying, shelling and shipping at the station, which leaves to the farmer just ten cents a bushel, only one-half of its nett cost of production, after allowing a fair price for the use of land, fixtures, etc. Now it is nonsense to suppose that farmers will continue to grow corn any great length of time at this rate; in fact but few farmers would have the ability to do it, even if they chose to make the attempt. The re-opening of the southern trade, or the re-opening of the Baltimore and Ohio railroad, with increased competition among the northern transportation lines must, at no distant day, bring down these enormous freights to a reasonable standard. It will be seen that a reduction of twenty-five per cent. will have the effect to keep up the supply, but if reduced to twenty cents a bushel, would leave a handsome profit to the western farmer. The ordinary lake freight is five cents a bushel to Buffalo, but last fall it was up to fifteen on an average; all we need ask to leave us the monopoly of corn is the reduction of the extra lake freight. We can see no reason why corn cannot be laid down in New York at less than the present price, and yet pay all parties a fair profit. With twenty-five cents to the country stations for shelled corn, the western farmer would be well satisfied, as that would leave him a round profit; the average freight to Chicago, eight cents, re-shipping, two cents; to Buffalo, five cents, re-shipping, one cent; to New York, thirteen cents; insurance one cent—total fifty-five cents. As some one must be paid for advancing the money and looking after the shipment and sales we add for that purpose five cents a bushel, a sum ample in all respects. This will make the entire cost at which corn should be laid down in New York sixty cents a bushel of fifty-six pounds. With these facts before him the eastern farmer will know whether or not he can compete with the west in this staple, and meet his brother farmers of the prairie on change in the seaboard cities.

It is generally supposed that the whole of the State of Illinois is a great corn producing country, but such is not the fact. The northern counties seldom produce a surplus over the local demand, being more occupied with the culture of spring wheat and the products of the dairy. The south half of the State as often purchases as sells, and it is the central portion that produces the immense supply that has made the State famous for this great staple. The south part of the State is known as *Egypt*, and is valuable for the grape, the peach, and other fruits that require a long season and a hot sun. The climate corresponds with that of at least four degrees of latitude further south on the Atlantic slope, or equal to that of the Carolinas, north of Columbia, South Carolina, though from its inland position, subject to more sudden changes of weather. In the more southern portion of this section, the winter wheat harvest commences the 25th of May. It is therefore strictly within the cotton growing region, and extensive preparations are being made to try the effect of free labor with this crop. A large portion of the inhabitants are more or less familiar with its culture, and we have no doubt of its success. The great error with people settling in that part of the State, has been their ignoring the idea of the low summer latitude, that is so marked a feature in the climate. The general elevation of the country is three to six hundred feet above the level of the sea, and on the whole possessing a climate soft and delicious as that of Italy. This part of the State has never been appreciated, because not understood, but now the war, by stimulating the growth of cotton, of tobacco, and of sugar, in the more northern portions of the region adapted to them, will people that part of the State with an industrious and enterprising population.

The lands are among the richest, and as they can be purchased at a low price, we shall expect to see immigration directed to that interesting part of the west. The Germans of Western Texas have proved that cotton can be profitably cultivated with free labor. With these facts before us, we need have no misgivings of the result, when backed with northern industry, northern skill, and northern implements on the rich soil of the basin of Egypt.

rich soil of the basin of Egypt.

Messrs. Editors, would you like a trip to the west—to visit the gardens of Chicago just as the cherry tree is sheeted with its mantle of white—pass south through the great corn zone, and feast your eyes on far stretching fields of thousands of acres of the springing blades—away down the prairie slopes into the basin of Egypt—drive among the fruit hills of the "Grand Chain," amid orchards laden with the young fruit and fields of wheat nearly ready for the harvest, and with the forest full-robed for summer? Come, and we will show you the prairie state in its vesture of vernal flora and midsummer splendor, *all in May*. It will be no tiresome ride over plains, across which the iron rail had just been laid, with the cabin of the emigrant or an impromptu village to relieve the grey setting of the prairie, and over which the autumn fires had gathered up the gifts of summer. It will show you the difference between then and now, and between the more exacting climate of the Lake region and the genial skies of the Valley of the Mississippi—between the semi-tropical products of the thirty-seventh parallel, and the hardy cereals of the north at forty-two.

M. L. Dunlap.

—*Country Gentleman.*

The Composition, &c., of Milk.

(*Concluded from page* 209.)

METHODS OF TESTING MILK.

It has been at various times suggested to m to consider whether a ready method of testing the quality of milk might not be devised. It is true that we have instruments—lactometers, as they are called—for ascertaining what is the quality of milk. But the instruments in use lead frequently to erroneous conclusions: they were based—most of them, at least, on erroneous principles. The common lactometer, which is in effect a float, like an ordinary spirit-float, when immersed in milk, indicates by its position the strength of that liquid. Milk which is more dense keeps the float higher: milk which is less dense allows it to sink lower. When water, therefore, is mixed with milk, the float will sink deeper. So it is said by those who constructed this description of lactometer. But there is one consideration which has here to be taken into account. It is this—that the butter in the in the cream is lighter than the whey of milk. Cream, I find by direct determinations, has a specific gravity of 1·012 to 1.019. It varies slightly. It is a little heavier than water, but lighter than the whey of milk, or skimmed milk. Milk rich in cream would, therefore, be lighter than milk poor in cream. By this lactometer an extra quantity of cream in milk is indicated in precisely the same way as an extra quantity of water. In short, this instrument, which measures the density of milk, furnishes very incorrect results. I cannot, perhaps, make this clearer to you than by giving one or two determinations. In testing the specific gravity of good milk, I found it as follows: 1·03 to 0·132. By skimming off the cream the gravity is increased. The lactometer, again immersed in the skimmed milk, now rises five divisions, and indicates 1 037. But if I take off from this milk the cream, and then put 10 per cent. of water to it, I get again precisely the same specific gravity which the new milk originally indicated, namely, 1 032 I believe that the commonest adulteration practised in large towns consists in people taking off the cream, and then if the milk be particularly good, adding a little water. This is not indicated by the common lactometer. Indeed, this was pointed out some time ago, and persons have in consequence sought to construct a lactometer on totally different principles. If the milk is put in a graduated glass and allowed to settle, some of the cream rises, and the quantity can then be read off. In good milk I find from 10 to 12 per cent. of cream by volume; in poor milk there is sometimes as little as from 6 to 7 per cent. of cream. Although this instrument (holding it up) does not give absolutely accurate results, yet it gives more useful results than I was first led to believe it would. It also gives results which are comparable. There are a number of tubes to compare the cream producing qualities of milk; and these might easily be put together in one piece of apparatus in a rack or box. I have here a case which may, if necessary, be filled with cold water. The tubes are graduated from the top, indicating the amount of cream which collects after the milk has been for some time standing. Temperature has, as is well known, an influence on the separation of the cream, but not so great an influence, as I find by experiments, as is generally believed. When the temperature is about 50 degrees, most of the cream is separated from the milk in from 18 to 24 hours. A small quantity only remains in the skimmed milk; about 7-10ths of a per cent. of fatty matter remains in it. However long you may keep milk at rest, it is impossible to separate the cream completely, but the greater portion separates in about 24 hours, and if the process be conducted at a temperature of about 50 degrees longer time than 24 hours will not separate an appreciably larger quantity of butter. I have kept milk in this instrument for 36 hours without getting a larger quantity of cream. The cream, however, is not quite conclusive, for the cream may get denser the longer it stands. It becomes denser when the temperature is increased; it diminishes slightly in quantity when the temp-

ture is increased to 70 degrees; but under such circumstances the cream becomes denser. In comparative experiments like these, it is well to maintain as nearly as possible an equal temperature. It is also desirable to shut out the influence of the air. This may be done very well by means of a tin case in which 5 or more lactometers may be placed. The milk may be kept cold by cold water, and a thermometer inserted in the tin-case to indicate the temperature. [The lecturer here shewed practically how this might be done.] In comparing these two methods with each other—the one which collects the amount of cream, and the one which gives the gravity or density of milk—it has struck me that a more correct result might be obtained if two instruments were used together; one to measure the amount of cream and the other to take the density of the skimmed milk Milk skimmed and watered will give at once little cream, and show a low specific gravity; whereas, milk which was merely skimmed and not otherwise watered would give a higher specific gravity than milk in its natural condition, but would give little cream. People using both instruments would be in a position to say at once, "This milk is watered;" or, "It is otherwise good milk, but the cream has been removed." When large quantities of milk have to be supplied to work-houses or public institutions, it is very desirable to have a ready mode of testing its quality. It might be arranged that when the milk comes in, some of it should be placed in graduated tubes, and at the end of twenty-four hours, the skimmed milk could be drawn off, and a float put into it. This float might be so constructed as to give the proportion of water in the milk from 10 to 12 per cent. I purpose to make a number of analyses of milk purposely mixed with water, and to construct a set of two instruments with a view of assisting in the solution of this practical question, and enabling in a ready way the quality of milk. I believe the thing can be done with some care and trouble. When the ordinary lactometer, which measures the amount of cream in the milk, is used, practical difficulty is experienced in removing the cream. You might do it with a pipette; but unless you have a very steady hand indeed you cannot get all the cream off: at any rate, the servants in a large establishment cannot be expected to do it. I have, therefore, thought of using an instrument similar to the alcalimeter of Dr. Moore, analytical chemist of Coblentz. It is a very handy instrument, whichis frequently used for many purposes in chemical laboratories. It consists of a graduated tube divided into one hundred parts, each of seven grains, the whole of which is the hundredth part of a gallon. You will, by this means, get a proportionate part of a gallon. The milk is filled in, and then left-four-and-twenty hours. The cream rises, and can be readily let off. [The Professor gave a practical illustration with the apparatus.] The whole operation is very simple. The specimen which I have here seems to be an exceedingly good milk, it contains no less than fifteen measures of cream. I put the sample here that I might be able clearly to exhibit the process. It is rarely that you get such a large amount of cream. If in London milk you get eight or nine measures of cream, you must be satisfied: very frequently you will get only seven, and even six measures. You can see distinctly [referring to the graduated tube] the line which separates the cream from the skimmed milk. The milk is prevented from flowing out by a list of India rubber tubing, which is pressed together by a kind of clasp, which opens the tube on applying pressure to it. By this means the skimmed milk may be drawn off with the greatest ease. After that a float is used to ascertain the specific gravity. The instrument which gives the specific gravity might be so constructed as at once to indicate ten, twenty, forty, or fifty per cent. of water in the milk. By means of this arrangement you get an idea of the quality of the skimmed milk, and are able to ascertain whether or not it is poor and thin; and you also measure off the quantity of cream. I am at present endeavouring to ascertain whether the cream is of anything like uniform composition when gathered in this way. If it be so, we might thus form an idea of the amount of butter which can be produced by a given quantity of milk; and in large dairy establishments which cannot be superintended by the owner, very great services might, I think, be rendered by enabling him to ascertain at once what amount of butter he might fairly expect from his dairywoman. There is another description of lactometer, or milk-tester, as it is called, which is simply a graduated cylinder, by which the milk is kept from the influence of the atmosphere, and which in other respects resembles these graduated tubes. In all ordinary tubes in which the graduation begins at the top there is this practical inconvenience, that the skimmed milk connot be removed by such a simple arrangement as that which I have described. I have lately directed my attention to the construction of a good milk-tester. There are various things to be taken into account, which I am engaged in investigating. For instance, I am endeavouring to ascertain whether the quantity of cream which is thrown off in a small-bore tube is larger or smaller than that thrown off in a large-bore tube—whether, in fact, size makes any appreciable difference in the volume. So far as I have gone I have not found any great difference in the volume of cream which is thrown up in graduated tubes of different diameter. Thus far, the indications are favourable; and I hope, at no very remote period, with the assistance of Mr. Griffin, the manufacturer of chemical apparatus, to produce a practically useful set

of lactometers. With these remarks on milk-testing I will conclude this lecture, and thank you for your kind attention. (Cheers.)

Mr. Beale Brown said he felt great pleasure in moving a vote of thanks to Professor Voelcker for the able and interesting lecture which he had just delivered. Perhaps the most interesting portion of the lecture was that in which it was shown that an increase in the quantity of food did not necessarily lead to an increase in the quantity of milk. He had found by his own experience that it was possible to give additional food to his cows, which tended to fatten them, without making any difference in the quantity of cream. He wished to ask the Professor one or two questions, and he should feel obliged by his answering them. He said it was impossible to separate all the cream from the skimmed milk. Would he state whether the practice of scalding milk, which was practised in Devonshire, did not produce a complete separation? He wished, also, to enquire what, in the Professor's opinion, was the effect of gorse on milking-cows. In the *Irish Farmers' Gazette* it was stated that the use of gorse greatly increased the quantity of milk; and if that were so, it might be well to resort to gorse at a period of the year when other kinds of food were not abundant.

Professor Voelcker said, as regarded gorse, although he had made an analysis of it, he was not practically acquainted with its influence upon dairy stock. From what he knew, however, of its composition, and of its practical effect in the case of horses, he was inclined to think that it might be given with great advantage to dairy stock. In some parts of Scotland, waste lands which did not bear anything before are now cultivated entirely with gorse, intended for horses; and he was inclined to think that a food which was given usefully to horses, being a concentrated food, might also be given with advantage to dairy stock. With regard to the other question, he had no doubt that the scalding of milk would throw up a little more cream; but no amount of boiling would effect a complete separation. Even in the clearest whey, when the curd was separated from the milk there remained a certain amount of cream suspended.

Lord Feversham, in seconding the vote of thanks, said, although the Professor's treatment of it was important, there were some interesting parts of the question into which he had not entered, and upon which information might naturally be desired. As regarded the analyses and experiments which had been mentioned, he must remark that, unless comparisons were made between animals of the same kind, it was very difficult to draw satisfactory conclusions. They all knew that the Alderney cow gave much less milk than the Shorthorn, but that, at the same time, the milk yielded a great deal more cream and butter. They had not heard anything on that occasion with regard to the Devon and Hereford breeds.

The Chairman observed that Professor Voelcker stated distinctly that the comparison was between three Shorthorns and three ordinary dairy cows.

Lord Feversham continued: there could be no doubt that grass-fed cows would in summer yield an abundance of milk if the pastures were good, and that the butter would generally be of good quality. As regarded winter keep, they might, no doubt, easily feed cows with too much oil-cake, and so injure their milking properties and diminish the quality of cream; but he supposed the Professor did not object to their being fed on roots, mangold wurzel, or Swede turnips. Turnips might sometimes impart a taste to the milk, and therefore to the butter; but he (Lord Feversham) certainly considered mangold wurzel early in the spring an important and essential element in the feeding of milch cows. That root would not generate too much fat in the animal, and it would, he believed, rather increase the quantity of milk. The noble lord concluded by expressing a hope that the lecture would at once go forth to the agricultural public generally.

The Chairman remarked, that some years ago the subject of the composition of the milk of dairy cows was before under discussion. A great desire was then expressed for some means of securing the cream without the process of skimming; and it was suggested that that might be done by means of a syphon.

Mr. Moore: thought he gathered from Professor Voelcker that the three Shorthorns and the three dairy cows of which he spoke were kept out at grass during the analyses.

Professor Voelcker said both sets of cows were out at grass, and remained under the same circumstances during the experiments.

Mr. Moore; The result of giving cake to both classes of animals was, that it lessened the quantity of milk yielded by both.

Professor Voelcker: Exactly so.

Mr. Moore thought he also gathered from the lecturer that the size of the vessel in which the milk was placed, whether it was large or small did not increase or lessen the quantity of cream. Some years ago considerable discussion took place as to what should be the shape and size of milk-pans. He should like to know whether the Professor thought that any particular shape or any particular depth of pan, would affect the quantity of cream which a given amount of milk would yield. Some years ago he (Mr. Moore) made some experiments with respect to the produce of Alderney cows, Shorthorns and Herefords, and the results were very satisfactory. He tested the milk in various ways, by the syphon, referring to the dates from the time of calving, and so on, and he found the quality of milk in the case of these different breeds of animals very uniform, although there was a considerable difference in quality.

Professor Voelcker, in reply, said the question with regard to the proper depth of milk pan was answered by the experience of good dairywomen. They found that shallow pans were the best: such pans threw up more cream than the others, and kept the quality of the milk better. The temperature was better regulated, which was very important, because when milk became heated it soon spoilt. It was quite an erroneous supposition that the access of air was injurious. The freer current of air there was through a dairy the better. What was injurious to milk was damp air. He was glad to see in the room a gentleman from Sweden, Professor Muller, who could, if he pleased, give them some interesting information with respect to the mode of keeping milk in that country. In a little book, published by a gentlemen in Sweden, there was a plan mentioned which consisted simply of keeping milk in shallow vessels of peculiar shape and handy construction, and admitting the air freely to it; at the same time you might make a fire in the dairy whenever one was required; and the author stated that whenever he saw a thunder storm approaching, instead of keeping his milk cool, he had a fire lighted to drive off the additional moisture.

Mr. Cantrell said the kind of pan which he had found best was a common earthenware pan, with a yellow glazed lining inside.

Professor Voelcker remarked that the great point was to have a shallow pan, with a perfectly smooth surface.

Mr. Blackburn said that he had always found that a small depth of pan threw up the largest quantity of cream, especially in warm weather. Milk would not keep so long in warm weather as in cold; and the sooner, therefore, the cream was thrown up, the better. In summer he invariably adhered to a pan of 1½ inches in depth and in winter to one of 4 inches. On that plan, the cream was thrown up much quicker, and the skimmed milk did not remain sufficiently long to acquire acidity. He had found that bean-meal produced a greater quantity of milk than any other kind of food. He had used it largely: and on comparing its effects with those of rape-cake and linseed-cake, he had found that it contained a larger amount of flesh-making principles than those substances, and not so much oil. He should like to learn why there was such milk-producing power in bean-meal.

Professor Voelcker said it contained a considerable quantity of starch. It was a fact borne out by experience, that bean-meal produced a large quantity of butter.

Mr. Blackburn said another substance which he had found to produce a large quantity of milk was grains, or draft. He supposed that it contained a large quantity of phosphoric acid.

Professor Voelcker: Yes, and lactic acid. It contained a large quantity of phosphate of lime, which was held in solution. A certain amount of grains was exceedingly useful for dairy stock, and so also was bran.

Mr. Blackburn said he had fed largely with bran. There was great difference between linseed and rape-cake. Linseed gave a very unpleasant smell; whereas rape-cake was more like grass land in its effects. The explanation might perhaps be, that the oil in rape-cake more resembled the oil in butter than the oil of linseed-cake resembled it. As regarded lactometers, he had used them for several years, and had encountered the difficulties to which the Professor had alluded. He would ask him whether some plan had not been devised for ascertaining the [illegible] of milk, or rather, the resistance which a [illegible] of milk offered to the passage of a ray of [illegible], and measuring it? Was not that a good test?

Professor Voelcker observed that there was such a lactometer; and it was altogether erroneous in principle.

Mr. Blackburn observed that milk was very much injured by travelling a long distance, the cream being so diffused in the milk, that it would not rise.

Professor Voelcker could easily understand that. The milk globules were quite broken in travelling; their contents were diffused through the whole mass, and consequently it was more difficult for the cream to rise.

Mr. Blackburn considered the keeping milk cool a very important point. He had to send a large quantity of milk twenty-five miles by railway, and if it arrived in a coagulated state it would be unfit for consumption. Formerly it was his practice to have the milk placed in the pans just as it came from the cows, at a temperature of about 60 degrees, and he had frequent complaints of the quality of the milk. He then made several experiments, with a view to improvement. Eventually he tried the plan of putting milk in refrigerators, and bringing down the temperature to that of water. The plan entirely succeeded; and since its adoption he had not had a single complaint. It was exceedingly important that milk should be kept as quiet as possible, and should be placed in pans, for transmission, before it was quite cool.

On the Composition and Feeding Value of the Straws of the Cereals.

BY THOMAS ANDERSON, M.D., F.R.S.E.

Nothing is more striking than the increased importance which straw has acquired in the modern practice of agriculture as a food for fattening cattle. Under the old system it was employed almost entirely as fodder, and when it was occasionally added to turnips, it was given less with the idea of any advantage to be derived from the nutritive matters it contained than with the view of correcting the too watery

character of that root, and thus facilitating rumination, promoting digestion and rendering it more valuable. In many parts of the country the property of using it in this way even was questioned, and it was never resorted to except in times of scarcity, when other and more nutritive food could not be obtained. Nor is this opinion at all surprising. We are in the habit of considering the moisture and more succulent varieties of food as the most nutritive and with them the dry and woody straws contrast unfavourably; but they do so not so much on account of the absence of nutritive matters as on their less valuable condition, due to the large amount of woody fibre by which they are protected from the action of the gastric juice, and enabled to pass through the animal in an undigested state. Hence it is that straw, when used alone, must be described as comparatively an innutritious food, and was naturally and justly considered to be inferior to hay, which, in the last century and the earlier part of this, was the staple food of fattening cattle. At that time the amount of the hay crop was in fact, the measure of the number of cattle which could be fattened on any farm; but the turnip immediately increased this number, and as its cultivation could be extended more than the hay crop, and the increasing price of meat added to the profits, it was pushed to the extreme, and it then became necessary to use straw to mix with the watery roots. As the advantages of this course became obvious, both in the increased quantity of fat stock, which could be sold off the farm, and the abundance of manure it afforded for the other crops, every inducement was offered to persevere in it, and the consumption of purchased food commenced and rapidly advanced. As most of these foods are of foreign growth, it was, of course, profitable to import only those which contain abundance of nutriment within a small weight, and hence again straw became necessary for the purpose of adding to the bulk of these substances, and enabling the stomach to dispose of them in a more satisfactory manner than it would otherwise do; for a very concentrated food which does not sufficiently distend that organ may pass through the intestines to a great extent undigested.

Such is the history of the use of straw in fattening cattle, and with its extension many questions of interest have arisen. It is now admitted that its nutritive effect is much higher than was formerly supposed, but we are still without any definite information as to its value compared with other feeding substances, such as turnips and the like: and further, as to whether there is any and what, difference between the straws of the different grains and of the same grain grown under different circumstances. It is generally understood that oat straw is superior to either barley or wheat, and it is also believed that the soil and other circumstances have a very important influence upon their feeding qualities, while it is also possible that there may be an appreciable difference in the straw of different varieties of the same grain. It is sufficiently obvious that a complete reply to all these questions would involve the analysis of many hundred specimens of straw, extending over a considerable period, so as to eliminate the effect of season, which in a single year is very apt to mislead. Still in the present imperfect state of our information a more limited inquiry will be of use; and it is hoped that the following investigation may prove an acceptable addition to our knowledge of this important subject.

In carrying out this inquiry it was of primary importance to devise some method of analysis suited to bring out the differences I wished to detect, and for this purpose the ordinary methods employed with oil-cakes, the cereals, &c., and which answer perfectly well for these concentrated substances, are of comparatively little use. They are founded upon the principle of determining the total amount of the different great classes or sections into which the nutritive elements of plants are divided. Thus, for example, in wheat we determine the amount of albuminous compounds, as measured by the nitrogen, of respiratory principles, and of oil, and in this case, when each group actually consists almost entirely of one substance, the information so obtained is amply sufficient. Thus, in wheat the albuminous matters consist almost entirely of gluten, and the respiratory of starch, and the whole grain is easily digestible. But it is quite otherwise with a straw, where our object is not only to discover what substances are there, but also what proportion of them is likely to be available to the animal and to be assimilated by it in the process of digestion. It then becomes necessary to seperate from one another the assimliable and non-assimilable substances, and this touches upon one of those points in chemical analysis which are in an unsatisfactory and imperfect state, and which require and merit further study. I commenced, therefore, by directing my attention to these points, and bestowed upon them a large amount of time, and performed a number of experiments, the results of which it is unnecessary to detail here. The general conclusion to which I came was, that though it might be possible to devise processes by which the proximate principles might be separated in some substances, it would not be practicable in all. Moreover, it did not appear that the separation of each of these compounds would throw any clear light upon their relative digestibility, and that, in the present state of our knowledge, it would be better, as well as safer, to restrict ourselves to a more limited analysis, though still more complete than those usually made.

It is obvious that if a food contains a considerable quantity of any nutritive element, as albumen, for example, but from some peculiarity in the condition in which it is present only a por-

tion, say a half or a third, can be assimilated, the value of the food is to be measured by that portion only, and not by the whole. The more nutritive foods are valuable not merely on account of the large proportion of useful substances they contain, but also because they are easily accessible to the animal. Thus in the turnip by far the greater part of its nutritive matters is soluble in water, little more than 2 per cent. of its weight being insoluble in that fluid, and of this small quantity a considerable proportion is dissolved by the juices of the stomach. In the cereals, although but a small proportion is directly soluble in water, the chemical changes they undergo during digestion convert them easily into a condition in which they can be absorbed. But it is quite otherwise with straws. In them the chief nutritive matters are partly soluble and partly insoluble in water, and they contain besides a large proportion of inert woody fibre. It will be easily understood that the substances soluble in water will be readily assimilated by the animal; and even those which are insoluble might, and probably would, also be taken up if it were not for the woody fibre which surrounds and protects them, and if it does not altogether prevent, must certainly greatly diminish the chances of their utility. Even in the most valuable food but a small proportion of the nutritive matters present is assimilated, and does not admit of a doubt that the portion soluble in water, or that which is most readily converted into a soluble state, will alone be absorbed.

In straws, it may be fairly anticipated that the soluble part is likely to be of use, and that the other portion, though it may, *if* rendered soluble, become useful, is so thoroughly protected from the action of the gastric juice by the woody fibre in which it is enveloped that in all probability it generally, if not invariably, escapes assimilation. In consideration of these facts it appeared to me that all the necessary requirements would be fulfilled by determining separately the quantities of each group of nutritive elements contained in the straws which are soluble and insoluble in water.

In following out this view of the matter, I at first attempted to effect the separation by macerating the straw in cold water, but it was soon found that in this way only a small quantity of soluble matters could be obtained, unless they were left in contact for a long time, and then a species of fermentation was apt to occur, which entirely altered the straw, and defeated the object in view. On the other hand, boiling water was inapplicable, owing to its producing coagulation of some of the albuminous compounds. After some trials a temperature of 140 degs. Fahrenheit was adopted, and was found sufficiently high to ensure the extraction of all soluble matters, without running the risk of rendering any of the albuminous compounds insoluble. The first fluid obtained in this way, by adding to the straw about ten times its weight of water, was brownish coloured and slightly mucilaginous, and contained the greater part of the soluble matters. Three or four subsequent additions of water were found sufficient for their complete extraction. The total amount of soluble and insoluble matters was thus determined, and the proportions of soluble and insoluble albuminous compounds were ascertained by determining the total nitrogen and the amount left in the insoluble matter. Owing to the bulky nature of straw, and the small proportion of nitrogen, this required very great care, and duplicate experiments were made, with closely corresponding results.

Wheat Straw.—Samples of wheat straw, of good ordinary quality from East Lothian and from the neighbourhood of Midhurst in Kent have been examined.

	Mr. Harvey, Whittingham.	Mr. S. Skirving, Camptown.	Kent.
Soluble in Water—			
Respiratory elements	2.68	6 68	5.26
*Albuminous compounds	0.86	0.37	1.37
Ash	3.38	1.55	4.97
Insoluble in Water—			
Oil	0 80	1.00	1.50
Respiratory elements	44 88	36.43	38.79
†Albuminous compounds	0.51	1.12	1.00
Woody fibre	32.88	34.78	35.01
Ash	2 82	6.19	1.35
Water	10.62	10.93	11.16
	99.43	99.35	100 39
*Containing nitrogen	0.139	0.06	0.220
†Containing nitrogen	0.082	0.18	0.160
Total nitrogen	0.221	0.24	0 380
" albuminous compounds	1.37	1.49	2.370
" respiratory elements	47.56	43.11	44.050

In examining these analyses, it is impossible to fail being struck by the small proportion of matters soluble in water which wheat straw contains. Excluding the ash, they amount in the first sample to no more than 3½ per cent., and in the other two to 7 and 6½ per cent. respectively. To these the large portion of soluble ash forms a very remarkable contrast, in two of the samples greatly exceeding the insoluble ash, and in the third (that from Camptown), though it falls short of the insoluble part, it must still be looked upon as proportionately large. The largest individual constituent in all these straws is the insoluble respiratory elements, and they materially exceed the woody fibre in quantity, a result for which I was not prepared. It is interesting to notice that, if we take the total albuminous and respiratory compounds, the difference between the specimens is by no means large, and the two East Lothian straws in particular are almost absolutely identical. It is only when the relative quantities of soluble and insoluble matters are taken into account that the difference becomes apparent.

Barley Straw—Samples of barley straw were obtained from the same localities as the wheat

straw, and are here distinguished as numbers 1' 2, and 3 :—

Soluble in Water—	No. 1.	No. 2.	No. 3.
Respiratory elements	3 22	6.11	4.56
*Albuminous compounds	1.42	0.39	0.66
Ash	3.30	2.87	3.38
Insoluble in Water—			
Oil	0.97	0.83	1.05
Respiratory elements	35.66	38.38	27.95
†Albuminous compounds	1.54	1.12	1.98
Woody fibre	41.34	36.62	47.53
Ash	0.91	2.75	1.47
Water	11.44	11.15	11 10
	99 70	100.27	99.68
*Containing nitrogen	0.228	0.063	0.106
† " nitrogen	0.247	0.180	0.317
Total nitrogen	0.475	0.243	0.423
" albuminous compounds	2.960	1.510	2.640
" respiratory elements	38 780	44.490	32.510

In these samples the differences are far from inconsiderable. In the first the total per-centage of albuminous compounds is about twice as great as in the other two, and it is nearly equally divided between the soluble and insoluble. In both the others the proportion of insoluble albuminous compounds exceeds materially the soluble. The total quantity is also larger than in any of the wheat straws, and there is likewise a considerable difference in the amount of respiratory elements and fibre, the latter varying from little more than one-third of the entire weight of the straw, in No. 2, to nearly a half in No, 3. It cannot be doubted that these differences must tell on the nutritive value of the samples, and that the first would, under ordinary circumstances, prove the most valuable, and the third the least so.

Oat Straw.—Owing to the great importance of oat straw, and its generally admitted superiority as a feeding substance, a larger number of analyses have been made of it than of the other grains.

	Sandy Oat Straw— Mr. Skirving.	Sandy Oat Straw— Mr. Harvey.
Soluble in Water—		
Respiratory elements	10 12	6 90
*Albuminous compounds	0 40	1.03
Ash	3 97	5.01
Insoluble in Water—		
Oil	1.45	0 77
†Respiratory elements	33.52	34.77
Albuminous compounds	0.93	0 43
Woody fibre . . .	35 36	38.73
Ash	2.39	1 27
Water	11.70	10 95
	99 84	99.93
*Containing nitrogen	0.064	0 170
† " nitrogen	0 140	0 090
Total nitrogen . .	0 204	0 260
" albuminous compounds	1.16	1.56
" respiratory elements	43.64	41.67

	Mellhill Inchture.	Midhurst, Kent (white one side)
Soluble in Water—		
Respiratory elements	12.01	6 23
*Albuminous compounds	0.95	0.33
Ash	1 60	1.92
Insoluble in Water—		
Oil	1.60	1 00
Respiratory elements .	23 35	30 95
†Albuminous compounds	1.21	0 33
Woody fibre . .	45 27	47 40
Ash	2 35	1 70
Water	11.70	10.55
	100 14	100.41
*Containing nitrogen	0 156	0 052
" nitrogen	0 211	0.052
Total nitrogen . .	0 367	0 104
" albuminous compounds	2.27	0.66
" respiratory elements	35.36	37.18

	Oat Straw grown at sea level, E. Lothian.	Oat Straw grown 850 feet above sea level, E. Lothian.
Soluble in Water—		
Respiratory elements	7.16	7.42
*Albuminous compounds	0.67	0.92
Ash	3 84	2 91
Insoluble in Water—		
Oil	1 25	1 36
Respiratory elements .	24 18	29.55
†Albuminous compounds	0 38	0 39
Woody fibre . .	48 94	44.40
Ash	1.27	2.16
Water	12.60	11.28
	100 29	100.39
*containing nitrogen	0.108	0.150
† " nitrogen	0.062	0.063
Total nitrogen . .	0 170	0.213
" albuminous compounds	1 150	1 310
" respiratory elements	31 340	36.990

These analyses fully justify the preference accorded to oat straw in feeding, for all of them show a larger and most of them a much larger proportion of soluble matters than either wheat or barley. There is however, a very great difference between the samples; that from Millhill containing nearly twice as much soluble as some of the others If this be taken as a measure of their relative values, then we should be induced to place that sample, and the sandy oat straw from Mr. Skirving, on a considerably higher level than any of the others ; while that from Kent would stand lowest. And this conclusion is justified by practical observation. In fact, the specimen from Kent was sent me by Lord Kin

naird, for the purpose of ascertaining whether there was any difference in the consumption of it and of the straw grown on his home farm at Millbill, because he had found a very material difference in their feeding properties. The straws grown on the sea level, and at 850 feet above it were analysed for a similiar reason ; it having been stated by Mr. Harvey, of Whittingham Mains, that there is believed to be a difference in their feeding qualities. The analyses scarcely bear out this opinion, as far at least as these two samples are concerned ; for though that from the high level is slightly superior to the other, the difference is so small that no conclusions can be drawn from it ; indeed, specimens from different localities vary to a much greater extent.

Passing from these points to the more general considerations regarding the nutritive properties of straw, it must be observed that their value is much higher than might have been expected. The position in which they stand may be best rendered obvious by a comparison with the turnip. That root contains on the average from 12 to 14 per cent. of albuminous compounds, and 4 or 5 of respiratory elements, of which 3 or 4 are soluble in water. It will be observed, then, that, as far as nutritive matters are concerned, straws generally stand far above the turnip, surpassing it slightly in the albuminous, and enormously in the respiratory elements. As a source of these elements they must hold a very high position, and in this respect are surpassed only by the grains and some few other substances. When compared with roots and grains, however, a very marked difference may be observed between the relative proportions of these two great classes of nutritive elements. The ratio of the albuminous to the respiratory compounds is, in the turnip, as 1 to 3 in round numbers, and in the grains as 1 to 7. That is to say, for every pound of the albuminous compounds contained in a grain, as wheat for example, there will be about 7 pounds of respiratory compounds. In the straws, the proportions are very different, the total respiratory compounds being never less than ten, and sometimes nearly thirty times as abundant as the albuminous. If the soluble portion of these substances only be considered, then the ratio approaches nearer to that observed in the more concentrated foods, though on the whole the excess of respiratory elements is very marked.

Returning now to the comparison between the turnip and straws, it is obvious that though the latter greatly exceed the former in the amount of substances which may be absorbed, no one would for a moment think of asserting that straws are therefore of greater nutritive value. The reverse is undoubtedly the case, and the cause of this is to be found in several considerations. 1st. It must be attributed in part to the indigestible proportion of those classes of nutritive substances ; for if highly nutritive substances, such as the turnip and grains, contain a relatively much larger proportion of albuminous compounds, then it may be expected that in the straw the small quantity of these substances will cause the assimilation of only a proportionate quantity of the respiratory elements, and the surplus will be waste. Hence also the use of highly nitrogenous foods, such as oil-cake and bean-meal, along with straw, must be considered good practice. 3rd. It may be fairly anticipated that the soluble portion of the nutritive matter will in general be of little, or possibly sometimes of no use. 2nd. Owing to the difficulty with which the soluble matters pass into solution in water, a considerable part of them may escape digestion. And in this respect the contrast between straw and turnip is very marked. In the latter the larger proportion of the constituents are not only soluble, but already dissolved in the 90 per cent. of water present, but in the former they are not dissolved, but are in the solid state in the dry straw, and must undergo the process of solution, which is effected during mastication and rumination. The difficulty of dissolving the soluble matters of straw in cold water has been already adverted to, and even when warm water is used the process is slow, and requires considerable time. From this it may be concluded that straw ought to be well moistened and steamed before being used. 4th. The large proportion of woody fibre existing in all straws must interfere materially with the production of the full effect of its nutritive elements.

Notwithstanding these drawbacks, the general conclusion to be drawn from this inquiry is, that straw, and more especially oat straw, possesses a very considerable nutritive value, but that it is most advantageously used along with the more highly nitrogenised foods. It must be observed, also, that in a mechanical point of view, it may even have its uses in the intestines, and by giving bulk and firmness to the mass of food contained in them, assist the process of digestion and absorption. Such are the conclusions to which analysis leads; and I will only add, that a minute and careful series of feeding experiments with straw, under different circumstances, would be a great boon to practical agriculture.—*Transactions of Highland Society.*

The Farmer as an Observer.

It has long seemed to the writer that the greatest defect in agricultural literature, as in all other, is the want of originality. As said a gentleman of the Empire State, several years ago to the writer, "we have had what is known up over again and again by editors and contributors to papers, who have done nothing really to advance the art of farming and stock-breeding. What we most want is men who by experiments

accurately made and reported shall advance the knowledge of tillage beyond where it has stood for many years." There is still the same deplorable lack of originality in the literature of the farmer.

The query at once presents itself, how is this to be done? Not by reading the records of the past alone, however valuable they are, but by observing with critical care all the phenomena connected with vegetable and animal physiology, in relation both to the earth and the atmosphere, including everything that affects the condition of domesticated animals and cultivated plants. Books contained only the known, and so far as their contents are valuable and useful they report the exact processes of nature in regard to the subjects discussed. Let the reader learn to discriminate therefore between knowledge and theory; in doing so he will soon learn that there is a wide difference between knowledge and theory, between experiment and hypothesis, between fine talking and writing and working in the field, between actual observation and predicable assertion.

In christianity faith is a fundamental, and therefore an indispensable element. But in physics demonstration entirely precludes the necessity of faith, and therefore the reader of an agricultural paper desires, and especially so if he is a practical farmer, to learn what a man knows, not what he believes, or what he asserts from hearsay. Neither by many or by few words does a writer commend himself is what they desire, whether it be conveyed in many or to the real hungerers and thirsters for knowledge. Truth, few words. Some pride themselves on short articles, seeming to convey the impression or conceit that because they write short articles, *ergo*, they are good; also that long articles, because they are long are worthless. Such, however, is not the decision of the analytical reader, for he learns to judge of the contents of a paper not by the length of its articles, but by their quality. What a man knows, not what he believes or has heard, is what the farmer wants and seeks by reading.

The advancement of farm literature must depend upon the observations of practical farmers, and not upon the hypothetical speculations of mere theorists, writers or lecturers who know nothing practically concerning the subjects they write or talk about.

What would a city schoolmaster say of a farmer who never taught school a day in his life, who should write an essay on school keeping, dictating how a school should be organized and conducted? Away with such nonsensical speculations, would say the practical teacher. Before undertaking to teach others, first learn by experience in the schoolroom what cannot be learned anywhere else; then instruct the masters. In such a decision the teacher would be right.

But to reverse the picture Suppose a city schoolmaster, known as the principal of a select school for young ladies, should attempt to write or compile an essay or manual on practical farming. What would the farmers be likely to say of it? They would say, just what practical schoolmasters would say, of those who know nothing practically about school-keeping, yet attempt to dictate by lectures or essays how to conduct a school. Just for a moment contemplate a city schoolmaster attempting to instruct practical farmers on the rotation of crops. *Ne sutor ultra crepidam.* is a Roman maxim of general application and at once suggests itself. It is quite as absurd for a schoolmaster to teach the practical farmer the niceties of the art of conducting a farm, or of economical agriculture, as it is for the farmer to attempt to teach the practical schoolmaster the art of conducting a school.

Did Mr. Bakewell, an Englishman, and the prince of stock-breeders learn his art from a schoolmaster's manual on farming? Did the Messrs. Colling produce the improved Shorthorns in a similar way? Or was it not rather by observation and experience united They were careful observers and experimenters; and thus the Messrs. Colling and Mr. Bakewell produced results that have proved their claim to the noble honor of being benefactors of mankind They did something to advance the practical art of cattle and sheep breeding. Men of like spirit and enterprise are now wanted in every other department of farming.

He who by experimenting learns how to grow the greatest amount of wheat, rye, corn, barley or oats per acre, with the least cost per bushel, will then be able to teach what every farmer wishes to know and what no farmer now does know. He also in the same way teaches how to grow annually that crop which is most profitable without regard to rotation of crops, by application of suitable fertilizers, will be entitled to a place on the scroll of fame, by the side of Bakewell and Colling, as a benefactor of his race.

To the same honor he will be entitled who teaches the cheapest method of making beef, mutton, pork and wool—any or all of these staple products. These lessons can only be learned by experimenters in the field and in the garden, among herds and flocks, and in breeding and feeding. Facts thus developed will furnish the material for making the science of agriculture, when they are all known. The facts in the possession of practical farmers to day, that have never found their way into any book or paper, are worth infinitely more to practical and economical farmers, than all that have ever been printed, from the times of Cato and Columella down to the present time.

Farmers! will you furnish facts for the *Country Gentleman*, no matter how common, for

they are needed and are worth infinitely more than speculations, no matter by whom produced. Too often is it the case when a farmer is invited to write for an agricultural paper, that he thinks he must produce a studied essay on some topic, when only *his facts* carefully presented with all their surroundings, are wanted. Farmers must learn to observe and record their observations, for in this way is agricultural literature to be advanced. MENTOR.

—*Country Gentleman.*

Pleuro-Pneumonia.

[We regret to hear that this fearful disease among cattle is again showing itself in the New England States. Recent accounts from Australia and even New Zealand, represent its ravages as most extensive and destructive. The following communication from an eminent Veterinarian first appeared in the *Fifeshire Journal*, and which we take from the *Irish Farmer's Gazette*. EDS.]

SIR,—Every communication I see in the newspapers from veterinarians about pleuro-pneumonia would lead agriculturists and the public generally to believe that infection was the whole cause of the disease.

I have seen as many cases of pleuro-pneumonia for the last nine years as I think could come under the notice of any veterinary practitioner, from young calves to old cows—in town byres, villages, farm steadings, and open fields, were its spontaneous origin has often been observed. If you were to tell a party who had reared all his own stock, and which had never been in contact with any other animal, that one of his was affected with pleuro he would scarcely believe you. When the disease became so prevalent in this part of the country, if an animal was observed to show the least symptom of it, it was at once put out of the way, and every precaution was taken to prevent contagion; yet the disease went on. One farm I know of was scarcely ever without it till the courts were drained and covered in, after which not another case occurred for four years, although about fifty head of cattle were kept on it. I know several farms, and in particular, where the steading is close by the road side, and where they rear mostly all their own cattle; when calves they are always reared at the road-side, and often on the road where cattle have travelled in the worst stages of disease, day after day, and disease raging on every side of it, yet there has never been a single case on that farm.

I know an extensive farmer who bought a short-horned bull, which he placed in a loose box along with a heifer. The bull shortly afterwards became affected with pleuro-pneumonia, and died in the same place after fourteen days' illness. There was a door which communicated with other cattle, and on the opposite side a byre containing about twenty milch cows; but another case never occurred on that farm for three years. Another farmer told me that he bought eight cattle and kept them by themselves for a fortnight, and as they appeared healthy he then placed them in a park beside other fifty. Shortly afterwards, however, they became diseased, and were ultimately sold at a great sacrifice; but not one of the fifty ever became affected. I attended a yearling which belonged to a small crofter, and was affected with pleuro. It recovered, and was shortly afterwards sold in the market to a farmer whose stock I had occasion to visit, and in the midst of which I observed the same animal without any bad result. On many farms single cases occur without going farther. Now, if the disease is so infectious as some writers would have us believe, how is it so many beasts escaped when placed in such circumstances? I kept a cow for six months, during which she travelled to and from her pasture on the road leading to the railway station, where diseased cattle were repeatedly going, and other cows beside mine, without any bad effect. I know that on a farm where their are two byres, each containing ten polled cattle, four in each byre became affected with pleuro-pneumonia. They were all removed after showing symptoms of disease, and treated for recovery. All the eight recovered, and as they began to get better, they were returned to their own stalls, and in the summer the whole twenty were turned out to graze in the park, and none of the other twelve ever showed the least symptoms of the disease. I knew of other diseased cattle that were disposed of, and three healthy ones immediately put in their place without any bad effect, although they remained several months till they were fat

Those agriculturists that have suffered most from it are beginning to think that we must look for other causes than contagion—a conclusion to which I also have come; and instead of selling their lean stock when they become diseased for little more than the price of their skins, are now treating them for recovery, and in many cases very successfully. I may mention that I have had both valuable short-horned bulls and heifers badly affected with pleuro that recovered, and afterwards produced healthy stock.

The question is often asked of a veterinary surgeon, "What is the cause of pleuro-pneumonia?" In my opinion, the first cause has been the great demand for beef, and the way in which that beef has been reared to meet the demand. On many farms there are too many calves reared for the amount of accommodation, and their milk not always of genuine quality. The moment the calves are dropped from their dams

they are tied by the neck, and for months together allowed no more room than to lie down and rise up again, breathing all the time an atmosphere nearly up to suffocation point. Thus, being without pure air and exercise, neither their lungs nor any of their other organs are ever properly developed.

There are four things necessary for laying the foundation of a good constitution—viz., good shelter, proper food, pure air, and exercise. Without these combined, predisposition to disease is the result. The want of exercise to calves predisposes them to joint ill, white scour, quarter ill, and pleuro; and a great number fall victims to these diseases every year. Where great attention is paid to the rearing of stock, it is seldom—at least so far as my observation, goes—that there is anything wrong, in comparison to the opposite plan of rearing without exercise and cleanliness. I would say one of the great existing causes has been carried on since cattle travelled so much by steam-boat and railway. They are driven to markets and often placed in trucks in a heated state, frequently remaining there for a whole winter night, and, with lungs so predisposed, they catch cold, which soon generates into disease. Also, in the extreme heat of summer, when cattle run so much in the heat of the day, their lungs become congested; then we have cold nights, they lie down on the damp grass, and pleuro is often the result.

If Mr. Gamgee would put agriculturists on the proper mode of rearing cattle to prevent disease, he should recommend them to give good shelter, proper food, pure air, and exercise in winter, and provide a protection to them in grass parks from the extreme changes in summer, and to be better sheltered in railway trucks, with fewer delays. If that were done, we would have less disease; and the Edinburgh dairy-man would have cows with better constitutions, if they would give them better accommodation—I am, &c. COLIN C. BAIRD, V.S.

Cupar, Feb. 26th, 1842.

Management of Live Stock in France.

(From the American Stock Journal)

We spoke in our last number, of the superior productiveness of English over French Agriculture in respect both to the crops, and to the animal product; and gave the estimate of Lavergne that the yearly *animal* product of an English farm is, upon an average, equal to the whole product of animals and crops upon a French farm of equal extent! The main secret of this strange fact is, that in the English system of husbandry, immense crops of turnips and green fodder are produced and fed out to sheep and cattle on the farm, thereby enriching the land and sustaining a heavy stock of animals for wool, mutton and beef. For instance, a Lincolnshire farmer thinks his farm under-stocked with sheep, if he does not feed on it, on the average, one sheep to each acre. His thousand-acre farm produces usually two hundred acres of turnips, and the like area of vetches, rye-grass and clover, all of which is consumed by his own animals, and so the land is enriched for his wheat and barley crops which he sells. The French farmer allows much of his land to lie fallow after a crop of wheat, instead of raising a green crop, and so he has nothing to feed to his animals, and can of course keep but few of them. It is, however, at this time our purpose to examine more in detail the French system of management of domestic animals, comparing it as we do with that of England, to see what lessons of warning or example Americans may find in the department of French husbandry.

CATTLE.

It is estimated that France possessed in 1836 about ten million head of horned cattle, while Great Britain and Ireland had about two millions less; yet is believed, upon the highest authority, that British agriculture on an area of land of less than three-fifths that of France produces one-fourth more meat, and twice as much milk for dairy products!

This is an astonishing difference, enough to attract the careful attention of all thoughtful men who are interested in agriculture. We will endeavor briefly to suggest the principal reasons for this result. Four different objects may be sought by keeping horned cattle,—meat, labour, milk and manure,—and as one or the other of these predominates in the mind of the farmer so he will vary his treatment of his stock.

WORKING CATTLE.

In France, as in America, oxen are worked by the yoke. We have often seen them in the south of France yoked with a straight piece across their foreheads strapped to their horns, drawing by their heads, instead of by their shoulders as with us, and were surprised to see that they handled their load apparently quite as easily as in our fashion. Nowhere, however, in the world have we ever seen, nor can there anywhere else be found, so large and fine specimens of working oxen, as in New England. In England, cattle are, in general, not kept for work but are bred for beef and milk only. There, the ox is a gentleman of leisure and dignity, fed with the fat of the land from calfhood to maturity. A speedy growth and great weight are the main objects. His duty is to grow fat and heavy, to do no labour, to take no thought for the morrow what he shall eat; but to grow into butcher's meat as speedily as he may. He does not wander over a hundred-acre pasture, picking among stones in a summer drought for a scanty subsistence. Clover fields to his knees, or the grass brought to his stall, or five bushels of turnips a day, with oil-cake to match, are his inheritance, and he is bidden to rejoice in his fo

r he will never see any old age. The breed cattle that will make the most beef at three ars old on the most abundant feed, is best for e south and middle of England, and this is no ubt the Short Horn. As soon as he attains s growth, his career ends in the shambles; d a growing animal takes his place. Incidentlly, of course, this enormous feeder furnishes immense quantity of manure, and thus en hes the farm.

Now in France, as in New England, the first e of an ox is to work. He may grow large d fat if he can, but he must work. In order work he must be hardy and active, and of bstantial age. Two-year-olds and even three-olds have no stamina; and so working oxen st be kept till seven or eight years old, and fact, in all countries where they are worked, y are kept long after their growth ceases to their keeping. Cattle bred for labor are, no ubt, rendered more hardy by ranging in pas-es, than being kept in small inclosures, and ps their meat is more healthful; but this sort of life does not lay on fat like stall-ding.

s it profitable to work oxen? In France s are worked often upon the plow. Is this fitable? Lavergne sums up the matter as to nce, as follows; and we see no good reason his remarks may not as well apply to Amer-

"I am aware that the substitution of milk- and butchering races for working animals, is always practicable. I am not finding fault those portions of our territory where culti-on is carried on with oxen, or even cows.—commend no sudden and rash change. I ly confine myself to stating facts as they t, and believe I have demonstrated that by e fact of the almost entire abandonment illage by oxen, the soil of Britain—even in-ing Scotland and Ireland—has in cattle ded a production double that of ours.—in Agriculture is the power of a correct ciple when practically carried out."

KILLING CALVES FOR VEAL.

he French, like the Americans, consider a respectable article of food, which is r the case in England. If we maintain a number of old cattle for labor, we have so the less keeping for other stock, and are elled to slaughter our calves, so that we as it were, obliged to eat veal, whether we t or not, to turn our calves to some account. estimated that in France, of four million of cattle annually slaughtered, two millions alves, giving only about seventy pounds of meat. The average weight of cattle ghtered in France is about 225 lbs., while in nd it is about 550 lbs.; the calves killed nce making most of the difference. The of using veal for food is manifest in er way. Calves for veal are usually kept rely on new milk, while in England they ken from the cow and fed upon cheaper fare. Besides, there are only produced in England as many calves as are wanted to be raised. Every calf will grow into beef; but a farmer breeding for oxen, or for cows exclusively, must select such calves as will answer his purpose.

One third of all the milk produced in France, it is said, goes to feed calves, and there can be no doubt that milk is much more profitably applied to feed human beings than animals. The breeds of cows in France are probably not inferior in milking qualities to those of Great Britain; but the climate is perhaps not so favourable, especially in the south of France. Where the sun is powerful enough to produce wine, the temperature is too high for the most favorable production of milk. The result of the different systems, with such allowance as should be made for climate, is that the dairy products of the United Kingdom with her three millions of cows, is estimated to be double in quantity that of France with her four millions of cows. Again, the cash value of these products being in England double their value in France; it is estimated that the dairy products of the former, are worth four times that of the latter. Lavergne makes all his comparisons with reference to prices as well as amounts; but we conceive this is hardly just to his own country. Although a hundred weight of beef may be worth in the English market twice the money it is worth in the French market, it certainly does not therefore possess double value for sustaining human life. But estimating dairy products in the two countries by quantity merely, we find in France but half the amount; and this is sufficient to lead to enquiry as to the causes of this result. The slaughtering of the calves, the working of cows, the maintaining of bullocks for labor after they have ceased to grow, are all opposed to the highest system of agriculture. There is, however, a heavy item to be placed to the credit side of the system of working oxen. They perform the labour which must otherwise be performed by horses or mules kept only for the purpose; and which not only eat and drink and are waited on through life, but return no meat in payment for their food at their death. The question of the profitableness of working oxen must still remain open, though Lavergne is decided in his opposition to it.

PIGS AND POULTRY.

As far as can be ascertained, the same difference exists as to swine in France and England, as we find in cattle; in the latter country the animal being killed younger than in France, although at about the same weight. This is a fact that meets us every where—that in England precocity or early maturity is the great desideratum. A large animal slaughtered young, is the idea of the English farmer; and manifestly it is the true idea. If you keep a pig two years to make him weigh as much as your neighbour's pig weighs in one year, you have lost at least one

year's keeping, as a general thing. But, it is estimated that the United Kingdom produces double the quantity of pork produced in France, a result accounted for by the fact that feed of every kind abounds in Great Britain, on all the farms.

In poultry, England is a long way behind France, the dampness of her climate being unfavorable to fowls. The English poultry yards are supposed to yield about five million dollars annually, while the annual product of eggs in France is said to be twenty million dollars, and of fowls as much more. A large portion of the population at the south of France subsist chiefly upon poultry so far as meat is required.

We intend in a future number to consider French Agrienlture as it relates to horses and sheep, showing the comparative profit of sheep husbandry from wool and meat.

Japan Lilies.

To the Editor of the Agriculturist.—I wish to know if any of your readers ever cultivated the Japan Lily. Would they do me the favor of giving me their mode and experience through the *Agriculturist*?

I have had them, but they appear to run out like the Hyacinth. The *American Agriculturist* says: leave them out all winter, and cover them with leaves or rubbish of some kind. Is this the best way? What kind of soil, and when had they better be got in—srping or fall? I do not like to dispense with so fine a flower.

R. B. Werden.

Picton, 30th March, 1862.

Berberries for Hedges.

To the Editor of the Agriculturist.—I believe the world has been ransacked far and near to find something that would answer for a hedge in this country; but as yet every thing has proved a failure. The Osage Orange is too tender, the Hawthorn dies out in places, and the Buckthorn is liable to be browsed off by cattle in the winter. But according to my observations and experienee, I think the common Berberry is the very thing we so much stand in need of, it being very hardy, easy of cultivation, and so offensive that no intruder will touch it I therefore call the attention of the Fruit Growers' Association, Nurserymen, and all others that are interested, to this important and much neglected subject—give it a trial. Would like to hear of the experience of others through the *Agriculturist*.

R. B. Werden.

Picton, 30th March, 1862.

Agricultural Intelligence.

Spring Shows.

We are informed of the following Shows take place this Spring. We request Secretaries of Agricultural Societies to inform us of their exhibitions at as early a date as possible so as to admit of publication in time to be of use to those interested:—

West Riding of York Agricultural Society, at Weston, April 23.

Reach and Scugog, at Epsom, April 29.

Pickering, at Duffin's Creek, April 30.

West Gwillimbury, at Bond Head, April.

Brant Township, County Bruce, at Walker, April 28.

County Peel, at Brampton, May 1.

North York, at Newmarket, April 30.

County Halton, at Milton, April 23.

Western Branch, Haldimand, at York, April 23.

County Haldimand, at Cayuga, April 24.

County of Lincoln, at Grimsby, April 22.

Hamilton Horticultural Society, 1st Tuesday May 24.

East Middlesex, at London, April 28.

West Middlesex, at Strathroy, April 24.

East Riding of York, and Townships of Markham, and Scarboro, May 7th.

Darlington, at Bowmanville, May 2nd.

County Kent, at Chatham, April 29th.

Flax Culture.

MEETING AT KINGSTON.

(*From the Kingston Whig.*)

According to public notice a large and essential meeting took place in this city at the office of the Secretary and Treasurer of the Agricultural Society of the County of Frontenac, on Saturday the 12th inst., for the purpose of devising means for the promotion of the growth of Flax. His worship, the Mayor, seeing the crowded state of the room, kindly offered the use of the Council Chamber for the meetings of the *Society in future. So great was the interest manifested in the growth of this article that, although* the roads were bad, there were parties from every section of the country, as well as from the adjoining counties adjoining. Henry Robinson, Esq., took the chair, when several gentlemen spoke of the utility of paying particular attention to its growth, being much more profitable than the ordinary crops cultivated in this country: William Ferguson, Esq., who has had considerable experience on this subject, dwelt largely on *the adaptability of the soil in this neighborhood* for its cultivation, and also urged the necessity of making early preparations for the Provincial Exhibition of 1863. His Worship the Mayor

ongly in favor of the enterprise, and hoped, fore long, to see it one of the staples of the untry.

There were several samples shown, both ssed and undressed, of excellent quality.

His Worship the Mayor exhibited some beau- l specimens of raw silk; also a handkerchief very fine texture, manufactured from the e of the Pine-apple plant, and a Mexican so rope made of the fibres of the leaf of the genus.

loved by his Worship the Mayor, seconded Mr. McClean, "That the Flax Dressing Ma- be placed in the Mechanics' Hall, at the stal Palace, for the use of these counties and ers."

loved by Dr. Barker, seconded by Mr. Gib- "That Henry Robinson, William Ferguson Edward Jackson, Esquires, be a Sub-Com- ee to take such steps as they may think ad- le for the management of said Machine" was unanimously resolved that a Committee, posed of the following gentlemen, viz.: Dr. ker, Wm. Ferguson, and Isaac Simpson, uires, be appointed to draft an address to the and County Councils, and to be distributed ugh the various townships for signature, r for aid to put the Crystal Palace Grounds Buildings in proper order and repair for the coming Exhibition in 1863.

was requested that parties requiring Flax- will leave their orders with either the Sec- y or G. S. Hobart (Seedsman to the Society), r before the first of May, in order that the ired quantity may be procured.

loved by Wm. Ferguson, Esq., seconded by A. Strachan, Esq, "That the thanks of the ing be given to his Worship the Mayor for indness in offering the Council Chamber to Society for its next meeting."

e meeting adjourned sine die.

ISAAC SIMPSON,
Sec'y & Treas'r C. of F. A. S.

The Future of the Royal Farms.

s satisfactory to learn that, hereafter and e future to bear the name of "The Prince rt's" Farms, they will continue under the immediate managers to illustrate the pub- it, enterprise, and perseverance of their for- tenant: and to furnish the same examples dlord, tenant and labourer, as when in the Prince Consort's hands. For owners of e examples will be still maintained which given of the permanent improvement and t equipment of estates—in all the particu- f buildings, drainage, roads, and fences. t farmers will see in continued operation, y rear, both the systems of steam cultiva- had adopted; and they will witness the s of herds of Shorthorns, Devons, and ds which the Prince had established with such ability and maintained with so much perseverance On the last occasion of his visit to the Flemish Farm he was heard explaining the great expenditure which had been incurred by him as tenant, and the need and reasonableness of it in order to the attainment of high character for the valuable herd of Herefords which has on that farm been at length established. The reasonableness of this expenditure will year by year continue to appear, as, under the same system of management which he had laid down, these farms and their respective herds shall maintain in their career the reputation he had obtained for them. It is a touching illustration of the pious care with which his agricultural reputation will be guarded, and with which the many useful agencies will be maintained which this one small section of his labours includes, that all the Prince's intentions regarding farming matters, where known, will be literally carried out, and where they can be imagined they will be carefully observed Thus we learn that all the stock which had been intended by him for exhibition at the Battersea Great Show, will, by Her Majesty's direction, still be prepared and sent—the Royal Farms will be opened to public inspection during the summer—and fields on Colonel H od's suggestion have been set apart, in which during the week of the great show, steam cultivation will be shown in operation on one of them. The management of the Home and Shaw Farms remaining as heretofore u der the immediate superintendence of Sir C. B. Phipps, K C B.—that of the Norfolk and Flemish Farms under the direction of the Hon. Colonel A. N. Hood—and the management of Windsor Park remaining in the hands of Major General Seymour and the Deputy Surveyor, Mr. Menzies—there is all the guarantee which devotion to the' memory of their chief, knowledge of his intentions, and personal ability and zeal can give, that the public value and u'ility of these farms and the public interest in them will be maintained.—*Gardener's Chronicle.*

Consumption of Roots.

Very few farmers take the trouble of weighing the quantity of roots consumed by their feeding bullocks. On a recent trial it was ascertained that a large three-year-old ox ate as much as 300 lbs. of yellow turnips per day, and when this quantity of good swedes, or even 100 lb. less, was given to him, he disregarded entirely his more natural food—straw—although it was constantly set before him. He seemed to prefer glutting down swedes, and in cold weather he had more or less of diarrhœa afterwards. If the same animal have the roots manufactured or pulped down into very minute pieces, and if this is mixed with finely chopped straw or chaff from the thrashing-mill, and fresh, one-half of the former quantity will fill him quite as well

and feed him much better, and his loose state of bowels will trouble him no longer. After careful experiments, we find that a large sized ox can be fed off upon six or eight stones of pulped turnips, with the addition of a few pounds of oil-cake. Ten tons of pulped proved equal in feeding value to 15 tons given whole and sliced, so three beasts can be kept in place of two, or, in other words, 20 acres of turnips are saved upon a 400-acre farm. The best plan, in our opinion, is to have the pulping and chaffing machinery driven by power, as it is up-hill work by manual labour, on a large scale especially. We should recommend Bentall's pulper, although it may be still subject to improvement. We have tried various pulpers, and we found the Perth prize machine worst of all; it may, however, be improved like others. As to chaff-cutters, there are so many in the market that it is difficult to hazard an opinion; but we should not hesitate in taking a prize machine from any of the Royal English Shows, from the great care with which their trials of machinery are conducted. For very young cattle or beasts of any age, when thus taken from grass, the value of a pulper is most apparent, for they will then go on feeding at once; and at that season it is an excellent plan to put the swede leaves through the pulper along with the bulbs. The quantity of straw or chaff consumed varies from 10 to 20 lbs. per day; and the whole theory of the success of this process of feeding appears to us to consist in the animal swallowing a much larger quantity of saliva than when eating whole or sliced roots. Every one must have noticed the saliva running from the mouths of their cattle when chewing cold roots. The entire immunity from choking or worrying is almost a most pleasant feature connected with the system, the conducting of which, no doubt, entails something beyond the usual expense for attendance and labour; but when two men and a boy (and 2 cwt. of coals per day) can prepare and carefully attend to 100 cattle, we consider ourselves amply repaid.—*Correspondent of Scottish Farmer.*

Death of "Windsor-"

We are sorry to have to announce the death of a very celebrated character, Mr. Richard Booth's Windsor, who expired, on Thursday, the 13th. "Scour," which could not be stopped, set in, and carried him off quickly. Windsor was calved in October, 1851, and was accordingly, upwards of ten years old. His honours in the show-yard were many and well deserved. He won the first prize in the calf class at the Yorkshire Society's show at Sheffield in 1852, and the first prize at the Durham County show in the same year; the first prize as a yearling, at the Royal Agricultural Society's show at Gloucester in 1853; and the first prize at the Yorkshire Society's show at York in the same year; the first prize as a two-year-old at the Highland Society's show at Berwick in 1854; the first prize at the Royal Irish Society's show at Armagh: and the first prize and medal and silver cup at the North Lancashire show in the same year; the first prize as an aged Bull at the Royal Agricultural Society's show at Carlisle in 1855; and the first prize at the Yorkshire Society's show at Malton in the same year. He was by Crown Prince, and his dam, Plum Blossom by Buckingham, obtained the first prize for the best cow at the Royal Society's show at Windsor in 1851. For physical reasons which need not be more particularly noticed here Windsor in the earlier part of his life, had failed to be a prolific sire Towards the close of his career, however, he became fruitful, and was certainly one of the most impressive sires that ever left the pastures of Warlaby Though with many others, we always thought him a trifle too narrow, he had a magnificent front with a fore-end that almost touched the ground, quarters long and well furnished, a back straight and firm, ribs springing out finely and round, unexceptionable loins, and thighs somewhat more perpendicularly shaped than those of Warlaby bulls generally are His disposition, too, was beautiful; he was as quiet as a lamb, We few *males*, either at Warlaby or elsewhere, of their existence to this famous bull. Sir R. "calls him father;" and Valasco, as Mr. B. states in the herd book, was either by him Crown Prince; it is not known which. Windsor the 2nd also, out of Satin, was his son Mr. Carr who rented him for a year, at the low sum of 200 gs., had several bulls by him these Don Windsor remains at Stackboo Young Windsor became the property of Mr. Bolton, of The Island, near Wexford; Imp. Windsor went in September to Mr. Foljambe at a rent of 120gs. a year; another, Fitz Wind was bought by Mr. Logan, of Maindee Ho Monmouthshire; and Royal Windsor, out Queen Charlotte, by Hamlet, belongs to Housman. These bulls, and any others by possess now a peculiar value.—*Bell's Messenger.*

Novel Importation of Stock.—The *maid*, which arrived from Canterbury last had on board 38 sheep from Mr George R. celebrated merino flock, consisting of 28 and 10 ewes. Some of them are intended for breeding establishment of the Emperor Napoleon at Rambouillet, according to the arrangement concluded with Baron Daurier by Rich on his visit there in 1859. The remainare for the improvement of Mr. Rich's establishment in England. The sheep will doubt, obtain for Mr. Rich the recompense merits in the full appreciation of the admirable qualities of his New Zealand-bred flock by who are well able to form an opinion.—*Australian and New Zealand Gazette.*

Lonk Sheep at the Show of the Royal ricultural Society of England at ˜ ˜ds.

hen at the show of the Royal Agricultural ty of England at Leeds last year, amongst merous lots exhibited we noticed a variety ountain or hill sheep called Lonks, very resembling the Scotch black-faced, but upon nearer inspection, exhibited much proportions, and the wool a finer staple. riz s offered by the Leeds local committee e section for the mountain breeds for the Lonk ram and the best pen of 5 Lonk ewes awarded Mr. Jonathan Peel, of Knowles-Manor, who gives the following account of

he Lonk is an old indigenous breed inhab-he Lancashire and Yorkshire hills, the blood being in the neighbourhood of ley, Rochdale, and also of Pendle Hill, Clitheroe. They have long been in high in their own district, and having been ed of late years, are gradually extending lves and taking the place of mixed breeds neighbouring hills. The rams are now sought after to improve these mixed , the attempt being by continued crosses the flocks gradually towards the pure ype. They are perfectly hardy, excellent s and ry prolific. The wool and flesh very superior quality. From experience ble to say that in all these qualities they ed the black-faces. I lost much time endeavour, by crosses with Southdowns ropshire Downs, to strengthen their t points, but was unsuccessful ; now, e, I have reverted entirely to Lonk, and ept away every prize at the last year's and sold my draft ewes at two guineas Few but drafts are ever to be bought, course, do they often fetch the price I mine. Thirty shillings would, perhaps, t the price of good ones. I have been d to send up fleeces to the Great Exhi-nd shall exhibit in all the 'mountain lasses at Battersea."

the great show at Leeds, we have been to find out something concerning this ifty and seemingly hardy breed of sheep, der correction of our English friends y be better able to throw light on the we are in some degree impressed with that though the foundation has been e original indigenous breed bred on ashire and Yorkshire hills and the hill stretching away to the borders of Scot-y have been with consummate judgment ith some other breed, which, while re-e original handsome and characteristic of the old race, conferred a greater ro-form and greater aptitude to fatten. somewhat fortified in this opinion by who says, in remarking on the Lanca-shire sheep, "Some flocks are kept on the mountains, in a very poor and neglected condition, and others are found on the low and fertile plains of the west; but the stock of sheep is small and ill attended, and the wool is very dirty and coarse and kempy, and the greater part possesses all the bad properties of the neglected mountain sheep." Youatt says, "This is very severe criticism, and doubtless was perfectly true at the time. More attention is now paid to sheep husbandry, but not so much as it deserves.

"The prevailing breed ˜ what is called here the Woodland horned sheep—a variety of the heath or mountain sheep, which, beginning to appear on the hilly country, are spread over the whole north, to the very extreme of Scotland. They are found pure, or with almost every variety of cross ; but the principal crosses, and which are decided improvements, are the Leicester or the Southdown, and by means of which both the carcase and the wool are increased in weight and value." Again, "The two ranges of hills, the Western and Eastern Moorlands occupy the greate. portion of it (North Riding of Yorkshire). They are cold and desolate, and covered with heath ; but the valleys by which they are intersected contain much good soil, and are well cultivated. The sheep that are found on them live on the open heaths all the year round. Their summer food at least, and often their winter food too, consists of heath and rushes, and a few of the coarsest grasses. The long-woolled sheep could not live there, and their owners have wisely refrained from contesting the possession of these hills. The moorland sheep are horned, and have black or mottled faces or legs. Their horns spread wide. Mr. Marshall says that the covering of their buttocks is mere hair, resembling the shag of the goat more than the wool of a sheep ; but this is considered a mark of hardiness. They are small, being not much larger than the heath sheep of Norfolk Ewes weigh from 7 to 10 pounds per quarter, and the wethers from 10 to 14 pounds. Mr. Marshall was a good judge of sheep, and there can be no doubt that the description was accurate at the time when he wrote; but the farmers have become better informed and the sheep have materially improved." —*Irish Farmer's Gazette.*

Evil Effects of Pampering Cattle.

We learn from recent English papers that Mr Booth's celebrated short horn cow, *Queen Mab* which obtained either first or second prizes at the National shows both of England and Scotland, has proved, in consequence of too high feeding, incapable of breeding. We saw this animal at the English Society's Show at Canterbury, in 1860, when doubts were gravely expres-

sed by competent judges on this point. Captain Gunter's Shorthorn cow, which won the first prize at the Royal at Leeds last year, is also disqualified, from the same cause. The splendid Bull *Statesman*, which we saw at the Royal Irish Show at Cork in 1860, has proved himself impotent as a stock-getter from the stimulating system to which he has been subjected. It is true these are but isolated instances, but it will be well for short horn men to be alive to them, or the fair fame of that distinguished breed will, by degrees, become tarnished. On this side of the Atlantic, Durham cows especially, may be occasionally seen at exhibitions in much too high a condition for safe breeding purposes. This is owing more to the absurd manner in which these animals have been treated, than to any innate defects of their own. "It is," remarks the *Mark Lane Express*, "the suicidal forcing system, which we have so long protested against, that is destroying the fair fame of the Shorthorns. The real value of a brood mare or a brood cow centres in her ability to breed, and the Royal Agricultural Society will yet have to face this abuse with more determination."

Horticultural.

Flower Beds and Bedding Plants.

Read before the Hamilton Horticultural Club by Mr. Geo. Laing, Gardener, of that City.

Mr. President and Gentlemen:—The winter that is now, we trust, nearly past, although long, has been favourable in many respects, particularly so, for horticultural in-door operations, the keeping of plants, &c. Such being the case it is to be hoped that all will be well supplied with plenty of good things for the coming season, so that the pleasure grounds, gardens, and flower beds, will be better and look gayer than they ever yet have done. Adverse as the times have been of late, Horticulture has continued to advance. This is encouraging and ought to stimulate all to push onwards in the good work—there is still much to do.

In my paper on flower beds and bedding plants last year, I noticed in a general way most of the kinds in use, their culture and management, and as I have been called on for another paper this year, on the same subject, it is not necessary for me now to touch much on any of the particulars I then noticed. In looking over the report of that paper in the Canadian Agriculturist of 1st of May last, I find that no notice was there taken of the bulbous flowering plants, a class that is very full of interest and very worthy of cultivation. Mr. Bruce in his paper to this club last month, so fully described this class, their nature, habits and culture, as to render any thing from me here unnecessary, further than to remark that they are very requisite in all places for flowering. In passing over the bulbs the mone and Ranunculus have occured to my worthy things, they are very much appre in the Old Country for their beauty and flowering, but here they seem to be little I believe this in some measure may be att to a fear of our long and hard winters, failures of a few that have tried them. I am ed to think they will do well if properly in fall in a good sandy loam, before the fr in, covering the beds over with a good l light stable manure or tree leaves, or a of both, laying boards on the top to turn rains, otherwise early in the spring put th to small pots, start them either in a fr pit with a slight heat, when a little ad and weather permitting plant them out suitable situation.

This season I hope that a greater eff be made with the shrubby Calceolaria a ding plant. It appears to me strange, wh do so very well in the green houses th wo'nt do outside; it is said that our clima hot for them, if so put them in a shade. are now many excellent new varieties, much praised in England for their qualities, their hardiness, profusion of rich and continued flowering habits, that I think ought to encourage their cul in this country. In the ribbon border which I shall here introduce, the Calceo almost indispensable.

Ribbon borders, pannelled beds and chains, &c.—strange things to be made of plants, but such is the case, and very they are. In the Old Country for some this has been the leading feature in flori over the length and breadth of the land as it may appear it is no less true, and commendation. Much has been and is be of it where it has been and is practised greatly has it been praised, but for all, all, it is nothing more or less than ment of colours, foliage shades, and proportionated growing plants. Simp may appear it requires both taste and ju to execute it properly. The principle and will answer well in any place, whet or small, no doubt the more extensive versified the grounds and gardens are t will be the effects. In this as in all oth of planting, the effects depend much nature and formation of the grounds, not now under consideration. My pres is, simply to convey a few ideas that beneficial to those of our energetic and amateurs who have made up their become ribbon men for this year.

First then, each and all individually to himself before he begins, in what shall I plant these grounds, gardens, have the most pleasing and expressive and to produce the best and most e

of flowers during the season? He thinks: ·ture of the grounds, borders and beds, are miliar to me, the attractive sights from the ion house, drawing room windows, conserv-, and all other conspicuous points I know, their bearings. He then considers, his mind absorbed on colours, lights and shades, and at is beautiful, by and by in ecstasy he ex-, I see it all prospectively! and then to n it in reality he commences his arrange- nothing down something such as the fol-g: The large border leading towards the n, I shall ribbon with some of my geran-such as Brilliants, Tom Thumb, and Flow-he day, with other fine things, here my cal-ias will come in first-rate, with Alyssum ·ted as outer edging if I can get it. The on each side the main walk from the n house I shall also ribbon, with some of liotropiums and fine hardy dwarf Lantanas, he choicests of my verbenas, with ceras-mentosium on the one side and blue lob-n the other. The beds in front of the n house, I shall panel, this will be in nice g with the house. This panelling is rather sh piece of work, but I shall manage it, my work I shall carefully frame, raising all tres, have no sunk panels, bearing always that each member of the order properly ish itself. With this view, for my framing I shall use plants of a close texture, ·en foliage with bright flowers of very colours, the panels of lighter shades, d procumbent plants with flowers dis-different from the frames. The small stripes on each side the serpentine walk to the summer house to be lined with all st dwarf and choicest flowering things n lay hold of. The figures in the distance group with my largest plants.

e manner described, the whole being ll enumerated and duly considered, when ting comes on the operator is enabled eed systematically and in order. It is me here to particularize, name plants or nd colours for this purpose, every ribbon-paneller must choose for himself. Our nds can aid much in the furtherance of ct being all good judges of colours and Most of the gardeners and many of the here are well stocked in verbenas, hel-petunias, &c., and of the older kinds of geraniums, but few have yet obtained the new varieties, such as Mrs. Pollock, let, one of the best geraniums out, and all purposes. Burning Bush, valuable r the flower garden, green house or tory, its peculiar leaf tint when grown plant gives a charming effect under 'olden Tom Thumb is here in all his th his fine golden broad margins in-in beauty with the growth of the plant, a bright green disc, dark zone, and a bright scarlet flowers. Perfection, of dwarf spreading habits with pure white margin, bright scarlet trusses, good either for ribbon lines or groups. Golden Harkaway, with its beautiful golden foliage and fine flowers, is a first-rater for vases, small beds or margins. Alma, with green disc and noble scarlet trusses. Golden Chain, with golden margin finely contrasted with a bright green disc and dark zone, producing an abundance of large trusses of dark shaded cerise blossom. Attraction, a fine variety with white margin fine rose zone or inner belt, green disc with pink trusses. Many more of the variegated and other new varieties might be mentioned, a few of which would be a very great acquisition to our bedding stocks.

Gazania Splendens is now plentiful, it makes a very nice bed and answers well in vases. Try and have the pansies in right compost this year and their beds in a shaded place. Mr. Dean says, in the Florist and Pomologist, published in London, February last, "that our favourite flower runs a great risk of finding a powerful rival, in the new and fancy forms recently introduced under the designation of fancy or Belgian pansy," he says, "that they are fast approaching the circular form combined with substance, which the stern laws of the florist demand before they can be admitted into their circle, wonderful things are doing now a days amongst the flowers by cross-breeding."

This same kind of fancy pansies is to be seen in Bruce and Murray's Nursery in this city; they are rather thin in substance, but well formed and pretty.

I may again let you have more on the bedding subject.

Deep Planting of Trees.

Most writers on fruit culture are agreed on the injury resulting from deep planting. Whether in noting the assertion, they all have clear and well defined ideas of what deep planting really is, is not so apparent. I rather suspect that the term is frequently employed by many who could not tell you whether a certain depth was too deep or the reverse. In fact it is one of those very indefinite and vague terms that get into print and are used "promiscuously." Now, I here put it to those who may hereafter use the term "deep planting," to state positively what it means in connection with their subject. It is frequently given as an illustration, that when a seed, an acorn for instance, drops on the ground and vegetates, the roots and stem of the future tree will be properly situated as regards depth of planting. Notwithstanding that this and similar statements are constantly being made, we never see the gardeners sowing their peas or any other seeds on the surface. On the contrary, all advices recommend covering more or less in depth with the soil, and very properly too, as all who ever attempted raising plants from seeds are fully aware.

The necessity of keeping the roots of plants within the influence of the atmosphere, is one of the most important truths in culture. but it does not follow that they should be kept on the surface of the soil. The impracticability of maintaining roots in a healthy condition, and in a medium where they can perform their offices, on the mere surface, must be well understood by all cultivators. Frequently in dry summers the soil is entirely destitute of moisture for a depth of twelve or more inches, and even if possible for a tree to survive the summer, the injury from freezing in winter would act very fatally. It may be said that mulching the ground with six inches of manure, charcoal, or some other non-conducting matter will obviate this difficulty, but where is the soil that will preserve a proper porosity after a series of heavy rains in summer, or the consolidating tendency of heavy winter snows. All experienced cultivators are convinced of the propriety and absolute necessity of keeping a loose, free surface soil, and the thorough beneficial effects of the harrowing and surface stirring; these effects are, too apparent to be gainsayed, and this stratum of stirred soil must be above the roots. Indeed there is no better protection against the drying out of root moisture than six inches of well pulverized soil, leaving out of the question the undoubted benefit gained by the amount of plant food liberated by exposing all portions of soil to the decomposing influences of the atmosphere.

On wet clayey soils, where draining should be, but has not been executed, and where trees are desired. it is a practice indited by common sense as well as by physiological reasoning, to plant shallow. By planting shallow it is not meant that the roots are to be superficially and imperfectly covered, but that instead of digging a hole in the ground, the tree is set on the surface and soil brought to it, covering it with five or six inches all over the roots. On dry and well drained soils, the plants are set *in* the soil, so that the roots are sufficiently covered, but yet it is not to be understood the latter are deep planted. No, both are properly planted according to the circumstances prevailing in each case.

Other circumstances besides the above will occasionally influence the depth of planting. Dwarf apple and pear trees grafted on the Paradise and Quince stocks, have to be so planted that the stocks are thoroughly covered with soil, so that they may be put out of the reach of the borer. These trees are grafted so that this practice can be adopted. The necessity of proper grafting in this case has been well shown by Mr. Mead, the present Editor of the *Horticulturist*, who was induced to purchase dwarf pears grafted on stocks twenty inches high, and in order to plant them according to rule, had to insert them nearly two feet in the ground to ensure the covering of the junction. This was a very definite case of *deep planting*, and as the trees mostly all died, it left not a doubt as to impropriety of the practice. But then it not follow that we should stretch to the r silk extreme and plant so shallow as not to perly cover the roots. My own practice been much modified as observation and e ence enables me to judge that that roots of cannot long be kept without injury on the mediate surface of the soil.—W. S. G.—*try Gentlemen.*

The Dairy.

Butter and Cheese.

We have been deeply interested with Martineau's charming little work, recently lished, entitled "Health, Husbandry, and P craft," which contains a selection of her contributed during the past few years in pages of "Household Words," "Chan Journal," and "Once a Week." Most cultural topics are discussed, such as pi poultry, drought and drainage, butter and and dairy management generally. In ther before us the need of butter as food is illu from the habits and economy of nations every latitude on the surface of the ear the butter-making described is chiefly Ireland, while the cheese-making is chie of Cheshire.

The butter and cheese making to w this article, we would refer, are those w carried on together in many of the large dairies, where a portion of the cream is from the milk, lest the cheese made from milk *should heave in curing. This is* tice in most Gloucestershire dairies. of 100 cows will yield probably 1½ cwts ter weekly in the height of the sea skim milk of a small portion set asi added to the whole milk morning and e before it is set for curd.

The difficulty of making a cheese of milk, which shall not heave, is one Cheddar cheese-making:—and the chie feature seems to be the scalding of t after it has been broken, at a much hig perature than is allowed in other di Cheddan cheese is worth 80s. a cwt; a good Gloucestershire may fetch 65s.; ence between the two is not, howev profit to Cheddar dairymen. For the

ary yields a pound or a pound and a half tter per cow weekly, in addition to ner e, while the produce of the Cheddar dairy olly cheese, or cheese and bacon.

the dairy business is yearly becoming of importance to Canadian farmers, the fol- g short account of their principal methods aking cheese in England, condensed from Martineau's book, will not be uninteresting r readers:—

GLOUCESTER CHEESE.—Under ordinary cement, the Gloucester cheese is made a day. The morning's milk is heated or d to about 80° in one or more large vessels m 80 to 100 gallons; a pint and a half or bouts of rennet is added to every 100 gal- in an hour's time or so, when the curd t, the curd-breaker, a wire sieve fixed on d of a pole, is slowly and repeatedly drawn and thither through the mass, the whey ed out, the curd is pressed by the hand, ded fine, and placed in a cloth and in the vat under a press for twelve hours; it is alted and turned, and again put under the

It is kept there as long as there is press- for it, and afterwards transferred to the shelves, where it is turned at intervals, here it gradually ripens. The whey baled the curd-tub stands and throws up a cream which an inferior butter is made. In ad- to the cheese, some 4 cwt. a-piece made ow, and the 36 lbs., or thereabouts, of and whey butter made per annum, they te in Gloucestershire on fattening a pig of 12 stone for every three cows upon the whey, &c., of the dairy.

CHESHIRE CHEESE.—The following may en as the ordinary history of a Cheshire :—The cows are milked at night, and the poured through a sieve into tin pans on or of the milk-house. This milk is skim- n the morning, and then poured into the tub where the curd is "set." As the ng's milking proceeds, the pailsful are ht one after another and poured through re into this tub. A pan of milk is warmed ing in a boiler in the dairy, and when ntly hot the whole of the cream just taken ed with it, and the whole thus warmed is at last into the tub, which thus contains ole milk, cream and all, of both "meals." mperature of the milk, when well mixed, be about 75 degrees Fah. The liquid ing matter, "annatto," about half a gill, an ounce of the solid colouring matter ed in half a pint of warm water, is added 100 or 120 gallons which may be then in tub as the produce of 40 cows; and the about a pint of brine, in which two or little bits of the prepared calves' vells ..n steeped over night, is added to the hich is then left for an hour covered up curd has fully formed. It is then cut with a wire curd breaker, and the curd sinking, the whey is baled out; the curd is collected and squeezed both by hand and the direct pressure of a weight above a board placed upon it, and the last of the whey being removed, it is lifted either into a basket or into one of the large Cheshire cheese vats ("thrusting tubs,") pierced with holes for the further escape of fluid —the lower part being a wooden cylindrical vat, and the upper a tin cylinder slipping into it as the curd on pressure sinks. After a certain pressure in this form, the curd is removed, and cut and broken by hand or by a curd mill, and from one to two pounds of fine salt is scattered over it, according to the weight of the cheese; about 1 lb. to every 40 lbs. of cheese is a common quantity. The whole curd being then re-broken is re filled into the vat, into which a cheese cloth has previously been placed. It is then put gradually under pressure, which, after the second or third day, amounts to nearly a ton weight upon each cheese. Every day the cheese is turned and wrapped in fresh cloths, and on the 7th or 8th day of this treatment, or as soon as dry, it is removed to the loft, and there swathed around with a linen band and placed on a bench, being turned occasionally until it is ready for sale. The Cheshire cheese is thus a whole milk cheese.

3. The CHEDDAR CHEESE is also a whole milk cheese. It differs in its manufacture from the others chiefly in the scalding of the curd. Immediately after the morning milking, the evening and morning milk are put together into the tub. The temperature of the whole is brought to 80 degrees by heating a small quantity of the evening milk. A small quantity of annatto is put into the milk along with the rennet, and in an hour, the curd having set, is partially broken, and a small quantity of whey is then drawn off to be heated. The curd is then minutely broken, and as much of the heated whey is mixed with it as suffices to raise it to 80 degrees, the temperature at which the rennet was added. In another hour, a few pailfuls of whey are drawn off, and heated to a higher temperature than at eight o'clock. The curd is then broken as minutely as before, and after this is carefully done, an assistant pours several pailfuls of the heated whey into the mass. During the pouring in of the whey the stirring with the breakers is actively continued, in order to mix the whole regularly, and not to allow any portion of the curd to become over-heated. The temperature is thus raised to 100 degrees, and the stirring is continued a considerable time, until the minutely broken pieces of curd acquire a certain degree of consistency; the curd is then left half an hour to subside. Drawing off the whey is the next operation, and the curd is carefully heaped up, and left for an hour with no other pressure than its own weight. The whey drips towards the side of the tub, and runs off at the spigot, no pressure being applied. The curd is cooled to 60 degrees, and put into the vat under pres-

sure for half an hour; at this time the curd is broken a little by the hand, and thrown upon a lead cooler, until it is brought down to the desired temperature. The after management of the cheese resembles that of the Cheshire. A little salt, 1½ lbs. per cwt., or thereabouts, is added to the crumbled curd, and it is mingled and broken by the curd mill.

The striking circumstance connected with all these methods of making cheese is that neither in the curd, nor the butter, if any, one in the bacon made by the consumption of the whey are all the contents of the milk, according to the analysis of the chemist, returned to the farmer. Mr. Harrison, of Frocester Court, Gloucestershire, has thus called attention to this important fact:—"The quantity of bacon fatted from the whey shows that there must be an immense quantity of valuable food left in it. But even allowing the whey to be worth £2 per cow, this is no. half of what its contents would be worth could they be extracted and prepared in the form of cheese and butter for human food. There is here a broad margin for experimental inquiry and improvement. On this point I have worked out the following from the records of our dairy. I take a single year, when the yield of milk was 31,700 gallons, weighing 321,000 lbs., and containing therein, by analysis, 12,480 lbs. of casein, and 11,556 lbs. of butter; now the dairy produce was of cheese 25,424 lbs., and of butter 3466 lbs.; and these contained, by analysis, 9765 lbs. of casein, and 8,366 lbs. of butter; leaving 2715 lbs of casein, or 22 per cent., and 3190 lbs. of butter, or 27·6 per cent. unaccounted for.

"Such a calculation is of course only approximate. For instance, instead of taking the double Gloucester analysis for the cheese that was made, it would have been more correct to take the Cheddar analysis, as we eneavoured to make the cheese much richer than in the former years. This would reduce considerably the large apparent loss of butter.

"The chief point is to see clearly that there is an enormous quantity of casein and butter which we do not extract from the milk. Can no means be devised for extracting them more thoroughly? I have no doubt the application of heat on the Cheddar system will do much, but a maker of this cheese was astonished to see the quantity of curd that resulted from boiling a small quantity of his clear-looking whey. I believe that the loss results from the system of minutely dividing the curd after it is set, and that it comprises some of the richest of the casein and butter. It is well known how much a successful result depends upon the gentleness with which this operation is performed."

The enormous loss which analysis indicates in the case of Mr. Harrison's dairy is probably, as he says, beyond the truth; but the truth itself must be bad enough; and the subject is one which much needs investigation by the agricultural chemist. It is satisfactory, therefore, learn that Dr. Voelcker, the chemist of Agricultural Society of England, has been some months engaged upon it. He gave main results of his research in a recent lec in Hanover square, and we look with great terest to its appearance in the next numbe the Society's Journal.

Veterinary.

Epidemic among Dairy Stock in Brit

(From the *Mark Lane Express*, Feb. 23d

The new number of *The Veterinarian*, February that is, has the following amo other FACTS AND OBSERVATIONS of the mon — "During the past few weeks *Ecz Epizootica* has prevailed to a very serious tent in the dairies of the metropolis and the rounding districts. Many cows have died, a far greater number have been disposed of great reduction of price, in consequence of coming affected with mammitis, ulceration the feet, &c., as sequelæ of the malady. purveyors of milk have been put to the gre strait to find a sufficienty supply for their daily tomers, and healthy cows from the country been purchased by them at fully twenty cent. above their ordinary value."

Significantly enough Mr. John Gamgee, Principal of the New Veterinary College Edinburgh, has just taken up the same su On only Wednesday last he delivered a p lecture in Edinburgh on the present tra unwholesome meat and milk, a full repo which is given in the *Edinburgh Veteri Review* for this month. The Northern h sor is able personally to corroborate the a ing character of the cattle disease as it is raging in the dairies of the metropolis: have recently visited London, where the plaints amongst the cow-keepers are ten Few I am told, are paying their way; some be thriving, but entirely by the system of s diseased cows to the butchers, or by ke very few cows, and 'drawing in' their By this is meant purchasing from the c who receive largely from the country. I to one of these dealers; and disease e amongst the cows to such an extent, tha said, although nothing can be more pro than cow-keeping if the cows retain their h we now lose seriously, and keep up our ta buying from all sources. Constantly, thr out London, have the lung and aphthous di existed for many years past; they prevail ly now, and about a month ago, epizootics broke out; it has spread north, and is at present time in Edinburgh."

It is satisfactory to see the Profession aw the evil now so alarmingly on the increase;

The Veterinarian is content, at least for sent, with a simple record of the fact, mgee goes elaborately into the subject as e question. It is not merely a critical r dairymen, butchers, or cattle dealers; e vital interests of the community are at stake. With the spread of the disease ll have a proportionate extension of the n diseased meat and milk. The sale of some beef and mutton has often ere now swelt upon, and by no one with more than Mr. Gamgee himself. "Within a atively recent period" let us here see the so-called murrain" has done amongst ries:—"The eruption occurs in the on the teats, and on the feet If calves mitted to suckle cows, or if pigs drink m milk, they are seized with violent irri- f the throat and alimentary canal, and It would not be to the dairyman's profit ot to consume such poisoned produce own premises; while as we fear is but probable, should he dispose of it in the anner to the public, it may be with such ences as these:—"Many instances, but ly experiments by Jacob and by Profes- wig of Berlin, have shown that an erup- r developes in man after drinking such f infants, who should have an abundant f this nutritious product, receive it thus d, what must be the result? Admitting ay be very rare that a child has been om such a cause, we certainly cannot ence any practice likely to inflict the pain or injury on tender babies."

here is matter for some very serious nd calling for some as immediate inves- The disease in the dairy is spreading. ay from any known cause? Simply, cause the most certain means are adopt- or prevention, but contagion. When a finds a cow affected he feeds her up, s her into the open market, where she midst herds of others, amongst which hy, fresh, country cattle are the most le subjects. The very obvious com- on such a course is that it should be at vented by due inspection and careful , so that no suspected animal should be o mix with others until properly passed ietly, either killed or cured. How lr. Gamgee to this? "The inspectors nd in our large towns, and who have hers (butchers), weavers, servants, n. &c., are unfit for such duties, which nal men can alone accomplish. To ac- men that they do not do their duty hey do not check the traffic in diseased s equal to accusing a man of a crime e won't jump over the moon. I un- y say, what I have repeated a thous- over, that the whole system of in- s a farce." As regards any remedy, er spoke out quite as strongly against the members of his own profession. We are by no means anxious to pit one "school" against another; but when, with the disorder raging as it is now admitted to be in London, we are told what our London authorities are, or rather are not doing, becomes us to ascertain how far the charge is warranted. If neglect is thinning our dairies and poisoning our people, amendment is at least to some extent in our own hands. Mr. Gamgee indignantly asks: "Is it not monstrous that with diseases so dangerous and so rife in our land, there is no infirmary in the whole length and breadth of her Majesty's dominions where half-a-dozen diseased cattle are ever seen —a stray case occasionally? I believe I saw three diseased cattle in three years that I was at the London Veterinary College, and so eager was I for practical instruction, that I hunted the dairies myself to see, to treat, and of course to kill perhaps oftener than I could cure. What would the public and our medical men say if medical schools had no hospitals? A scanty variety of patients, chiefly a few lame horses, are not likely to teach our students how to benefit the farmer; and, as the Principal of one of our Veterinary Colleges, I attack the system which condemns the public to eat diseased cattle, whilst no effort is made to teach men how to control or prevent disease."

How to Choose a Farm Horse.

John Brunson, in a late issue of the *Ohio Cultivator*, lays down the following rules to be observed in the choice of a horse for the purposes of the farm:

"The farmer requires a horse that can take him to market and around his farm, on which he can occasionally ride for pleasure, and which he must sometimes use for the plow and harrow. First to notice are the eyes, which should be well examined. Clearness of the eye is a sure indication of goodness. But this is not all—the eyelids eyebrows, and all other appendages, must be considered; for many horses whose eyes appear clear and brilliant, go blind at an early age: therefore, be careful to observe whether the part between the eyelids and eyebrows is swollen, for this indicates that the eye will not last. When the eyes are remarkably flat, sunk within their orbits, it is a bad sign. The iris or circle that surrounds the sight of the eye, should be distinct, and of a pale, variegated cinnamon color; for this is a sure sign of a good eye. The eyes of a horse are never too large. The head should be of good size, broad between the eyes, large nostrils, red within, for large nostrils betoken good wind. The feet and legs should be regarded; for a horse with bad feet, like a house with a week foundation, will do little service. The feet should be of middle size and smooth; the heels should be firm, and not spongy and rotten. The limbs should be free from blemish-

es of all kinds, the knees straight, and back sinews strong and well braced. The pastern joints should be clean and clear of swellings of all kinds, and come near the ground; for such never have the ring-bone. Fleshy-legged horses are generally subject to the grease and other infirmities of that kind, and therefore should not be chosen. The body should be of good size, the back straight, or nearly so, and have only a small sinking below the withers; the barrel round, and the ribs coming close to the hip joints. The shoulders should run back, but not too heavy; for a horse with heavy shoulders seldom moves well. Chest and arms large. A horse weighing from 1,300 to 1,400 pounds is large enough for a cart horse; from 1,000 to 1,200 is large enough for a farmer's horse; from 1,000 to 1,100 is heavy enough for a carriage horse. I should advise every one to get some experimental knowledge of a horse before purchasing."

Miscellaneous.

Strength of the Tiger.—The strength of the tiger is prodigous. By a single cuff of his great fore paw he will break the skull of an ox as easily as you or I could smash a gooseberry, and then, taking his prey by the neck, will straighten his muscles and march off at a half trot with only the hoofs and tail of the defunct animal trailing the ground. An eminent traveller relates that a buffalo belonging to a peasant in India having got helplessly fixed in a swamp, its owner went to seek assistance of his neighbours to drag it out. While he was gone, however, a tiger visited the spot and unceremoniously slew and drew the buffalo out of the mire, and had just got it comfortably over his shoulders preparatory to trotting home, when the herdsman and his friends approached. The buffalo, which weighed more than a thousand pounds had its skull fractured, and its body nearly emptied of blood.—*Wild Sports of the World.*

Mode of Living in Iceland.—The walls of the room are still of the colour of the wood, but it is easy to see that they are new. Within a year, the peasant remarks, they will be handsomely painted. In the backgrounds our searching glance detects a small alcove; and a clean bed is visible between the half-drawn chintz curtains. The space between the windows is occupied by a table and several easy chairs.—Against the walls, to right and left stand the newly polished commode, and a species of secretaire in oak. The conversation between ourself and the peasant certainly progresses but poorly as we both maltreated Danish; but, ere long, his daughter appears, an underset girl with bright red plump cheeks, and the stumpy nose peculiar to the daughters of the land. She is busy in preparing the meal. The tablecloth is of snow white linen, the service of the finest china the spoons of heavy silver. Soon a tureen rice-soup steams on the table. The following dishes are magnificent: Trout with their pearly-red meat, smoked mutton, eggs, supplied the ducks dwelling on the adjoining lakes of the well-tasted national fish *skyr*; and as finale, coffee. A *gourmet* might possibly find some fault to find with the cookery, but the hungry traveller is not dainty. When, besides enjoyments, he has the certainty that a soft down is awaiting him, such as can only be found with in princely palaces, he has everything combined to make him comfortable.—*Wild Iceland.*

Use of Fat.—"What is the use of fat? It performs several offices; one is to round out system and complete the beauty of the form. Your cousin Jane's smooth neck owes its roundness to the skilful manner in which the adipose matter is packed into all the crevices between muscles, veins and arteries. For nature exacts no small amount of labor in the production of beauty. "Behold the lilies of the field how they grow; Solomon in all his glory was arrayed like one of these!" Another use of the adipose matter is to serve as a reservoir of aliment for the nourishment of the system. In the fever which I recently had my stomach was in such a state that it could digest no food, and by one of those beautiful adjustments so common in nature, my stomach rejected it, and I did not eat a mouthful for several days. The consequence was that the heat of the body had to be kept up by burning the fat in the system, and how rapidly it was consumed! I suppose I lost twenty pounds in the course of three days. Hibernating animals that sleep through the winter, are generally as fat as they can be, when they crawl into their nests in the fall. Their thick furs prevent the radiation of heat, so that little is required to be generated; their breathing and circulation are sluggish, causing a slow consumption of fat, and this matter is supplied by a store of fat in the system, which is slowly burned up during the winter, and the animals come out in the spring as lank as Pharaoh's lean kine. If you put a piece of fat on the fire you will see that it burns with a blaze. Whenever any animal substance burns with a blaze you may be sure that it contains hydrogen. The burning of a substance is simply its combination with oxygen. Whenever an organic substance containing hydrogen is sufficiently heated, it is decomposed, and, as the hydrogen is separated from the other elements, it takes the gaseous form. In this hot state, as it comes in contact with the oxygen in the air, it combines with it—in other words, burns; one atom of oxygen combining with one atom of hydrogen, and producing water. There is phosphorus in the bones, which, when separated, will burn with a flame, but not invariably, when you see any animal or

stance burning with a blaze—the flame of a
, of a kitchen fire, of a burning building—
hydrogen in the act of combining with oxy-
producing water. On the other hand, when
see any organic substance burning with a
heat without blaze like charcoal or anthracite
it is carbon combining with oxygen, and
ucing generally, carbonic acid. If the blaze
nces a good deal of light, you may be pretty
that the substance contains both carbon
hydrogen, the light coming principally from
intensely heated carbon before it is burned.
ew England Farmer.

SARDINIAN FARMHOUSE.—In this court are
ements of husbandry, antique enough to tax
genuity of Jonathan Oldbuck himself as to
real origin; and in a snug corner are neat
of cork pails, there placed in pleasing an
tion of the coming milking time. There is
mendous baying and rushing forth of enor-
boar-hounds, silenced with difficulty by an
ly tremendeous "Ai ha!" and "Zitto!" from
rmer, where at the noble creatures wag their
nd crouch their several resting-places. And
armer, with his short kilt of black home-
wide white cotton drawers and sleeves—so
white, too—and loose sheepskin, sleeveless
with the shaggy wool outside, neatly-gai-
legs, long black beard, and knife-garnished
certainly he does not look much like a
ful tiller of land and tender of flocks; he
mind at least) much more resembles a
o banditti." Nevertheless poor Renzo is
ful and harmless enough, and we may as
ollow him into his cheerful and hospitable
n." The first room is, as usual, the gener-
partment. The hugh smoking smoulder
occupies the centre; in one corner, neat-
ed up, are the sleeping mats, which at
will be unfurled and placed in a circle
the log, to serve as couches for the young-
mbers of the family; the luxury of beds
reserved for married couples or occasion-
sts.—*National Magazine.*

SNOW.—The snow was proverbially called the
farmer's manure" before scientific analysis
own that it contained a larger per centage
monia than rain. The snow serves as a pro-
mantle to the tender herbage and the
of all plants against the fierce blasts and
winter. An examination of snow in Si-
howed that when the temperature of the
seventy-two degrees below zero, the tem-
re of the snow a little below the surface
enty nine degrees above zero, over one
d degrees difference. The snow keeps
th just below its surface in a condition to
chemical changes which would not hap-
he earth was bare and frozen to a great
The snow prevents exhalations from the
nd is a powerful absorbent, retaining and
g to the earth gases arising from vege-
nd animal decomposition. The snow, though it falls heavily at the door of the poor, and brings death and starvation to the fowls of the air and beasts of the field, is yet of incalculable benefit in a climate like ours, and especially at this time when the deep springs of the earth were failing and the mill streams were refusing their motive powers to the craving appetites of man. If, during the last month, the clouds had dropped rain instead of snow, we might have bored the earth in vain for water; but, with a foot of snow upon the earth and many feet upon the mountains, the hum of the mill-stones and the harsh notes of the saw will soon and long testify to its beneficence. Bridges, earth-works, and the fruits of engineering skill and toil may be swept away, but men will rejoice in the general good and adore the benevolence of Him who orders all things aright. The snow is a great purifier of the atmosphere. The absorbent power of capillary action of snow is like that of a sponge or charcoal. Immediately after the snow has fallen, melt it in a clean vessel and taste it, and you will find immediately evidences of its impurity. Try some a day or two old, and it becomes nauseous, especially in cities. Snow water makes the mouth harsh and dry. It has the same effect upon the skin, and upon the hands and feet produces the painful malady of chilblains. The following easy experiment illustrates beautifully the absorbent property of snow: Take a lump of snow (a piece of snow crust answers well) of three or four inches in length, and hold in the flame of a lamp; not a drop of water will fall from the snow, but the water, as fast as formed, will penetrate or be drawn up into the mass of snow by capillary attraction. It is by virtue of this attraction that the snow purifies the atmosphere by absorbing and retianing its noxious and noisome gases and odors.—*Exchange.*

AN AUSTRALIAN BANQUET.—A banquet of a novel character has been held in Melbourne. Some time since an acclimitization society was set on foot by Mr. Edward Wilson, who has effected so much in the way of introducing foreign animals, game, singing birds, &c., into Victoria. This society is now numerous, and has several life members. They have had an experimental dinner, at which were served up many of the native animals, birds, and fishes. The bill of fare comprised kangaroo, walluby, wombat, bandicoot, opossum, and porcupine, among the animals; black swan, wild turkey, paroquet, waterhens, and wattle-birds, among the fowl; and most of the fish of the Australian seas and fresh waters.

VITALITY OF SEEDS.—There is a great difference in the duration of vitality of seeds. Those which have much oil in their composition spoil rapidly, owing to the fatty matter becoming rancid. Seeds of different character, particularly those protected by a shell. Cucumber seeds have been kept good nearly 20 years, corn 30 years, and wheat for more than 1000 years.

BOARD OF AGRICULTURE.

THE Office of the Board of Agriculture has been removed to 188 King Street West, a few doors from the late location adjoining the Government House. Agriculturists and any others who may be so disposed are invited to call and examine the Library, &c., when convenient.

HUGH C. THOMSON,
Secretary.

Toronto, 1861.

Notice of Partnership.

THE Undersigned have entered into Partnership as Seedsmen and dealers in all kinds of Agricultural and Horticultural Implements, under the firm of James Fleming & Co.

JAMES FLEMING,
GEORGE W. BUCKLAND.

NOTICE.

JAMES FLEMING & CO., Seedsmen to he Agricultural Association of Upper Canada will carry on the above business, wholesale and Retail, at 126 Yonge-st., 4 doors North of Adelaide-street, until next July, when they will remove to the new Agricultural Hall, at the corner of Queen and Yonge-streets.

JAMES FLEMING will continue the business of Retail Seedsman and Florist at his old stand, 350 Yonge-street.

Toronto, January 1st, 1861.

FOR SALE.

AT

WOODHILL, WATERDOWN P. O.

MR. FERGUSSON expects to have several *pure Durham bull calves* to dispos of next Spring, 1862, not intending to raise any this season. These calves will be all of the *well known DUCHESS tribe*, and will be put on the G. W. R. R. at six weeks old for eighty dollars each.

N. B.—Frst come, first served.

Waterdown, Nov. 14, 1861. 4-t.

THOROUGH BRED STOCK FOR SALE.

THE SUBSCBIBER has for Sale Durham and Galloway Cattle, male and female. Leicester, Cotswold, and Lincolnshire Sheep, male and female.

January 1, 1862. JOHN SNELL,
tf. Edmonton, P. O., C. W.

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