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WINTER WORK FOR FARMERS.

During the winter months a large portion of our Farmers content themselves with doing little else beyond procuring and fitting for use the annual supply of fire wood.

This is soon done, as also the fencing and building material; posts, rails stakes, poles, and logs, so as to be in readiness for spring work. He should also procure what may be necessary for the various purposes of the garden, cedar poles in preference to birch and alder for beans and peas.

JANUARY.

Crowded out in Last Number.

See that the *Cattle* are well tended. If so they will look as well as when first taken from grass. They will soon come to know the rustling and cutting of the hay and straw, the chopping of the roots, and the dash of the meal into the trough. They demand our constant attention during this inclement season, and theirs is no bad index of the character of the owner. Well fed stock alone can be profitable. The *Barn* should be kept neat in every respect—the cattle should be supplied with abundance of clean litter, and the place should be kept warm and comfortable, but well ventilated—all cracks and crevices should be carefully closed up. The cellar should be tight so as to prevent cold draughts coming up from below. Give the *Horses* a moderate supply of roots, and they will reward you by the sleekness of their appearance, and let them be covered with a blanket, or rug of somekind when they come in sweating from work. Provide *Sheep* with comfortable litter and abundant food. Hogs will repay attention, you will do well to keep them warm, and good feeding will not be thrown away upon them. Give Poultry food composed of boiled potatoes, and other roots mashed and mixed with meal; small corn and dressings of oats, barley, Indian Corn, scraps from the kitchen, with pounded shells of any kind to supply the matter for forming the egg shell. Give roots abundantly to all stock as you can spare them, and, despite the expense in the cultivation, if you make one years trial, you will take care never again to want them, the improvement and condition of your stock even surprising yourself—if these auxiliaries be but economically used. There is great waste in burning *Green wood*, besides the discomfort. The swamps are now frozen, and the maple may be cut and drawn home. See that the wood-house is well and timeously stored. Examine your *Stock of Tools*. Mark what is wanting and needs repair. Watch your neighbours to see if there is anything new worth providing in this direction. If you can possibly afford it, you will never loose by purchasing any truly valuable labour saving machine, whether a Straw Cutter, a Pulping Machine, a Cooking apparatus on a cheap and good principle, a potatoe digger, a corn Husker, a horse Rake, or an improved and valuable implement of any kind, provided you really require and can turn it to full and immediate use. Trim your grape vines if you should have any, as, with this season, the wound will sere over better than if neglected to February or March. This is the time for laying out your plans for the year. Set about it without delay, Plan deliberately—act steadily thereupon—and you will find that order and system will ensure profit and independence. This is the time for *marketing* a portion of your produce. Carry hay and grain, when weather is too severe for vegetables, should you have a convenient market. If

not, be exercising your jndgement, you can consume them profitably on the spot in feeding your stock.

FEBRUARY.

This is the Farmers leisure month. Lay your plans for the coming season, so that you may be ready to act without loss of time or hesitation. See that you have an ample supply of wood split and prepared for the year. *Repair your Buildings* where required, and consider any new arrangements or improvements, and proceed with their prudent adoption. Keep your *cattle* warm, well littered, and fully fed as far as your means will permit of, for you will in this best ensure a profit for stock. Guard against accidents from frost in many ways—all well known to the Farmer. Prepare and store away *seed corns*. Watch attentively, and be liberal to your *cows* about to *calve*. Complete your supplies of wood for all purposes, if not attended to last month. Keep horses well littered, and well fed with warm food, if procurable, with cut hay and carrots, and guard against the effects of cold as recommended last month. Pay great attention to cows which are to about calve. Keep *Hogs* well bedded, with plenty of cooked food. See that Fowls are well sheltered, and fed as recommended for last month, and you will be well repaid by their sustained condition, and a plentiful supply of eggs. Cart out manure to the field, placing in large heaps, so as to prevent loss by washing. But unless to facilitate spring work where absolutely necessary, it is better to remain under cover till the last practicable moment. Prepare *seeds* of all kinds for the incoming season. Prepare implements and tools as directed, last month—providing new ones where absolutely necessary—but not to gratify whim or fancy.

EXPERIENCE WITH MUCK.

In the summer of 1855, I had an upland lot, preparing for wheat or rye, and having no funds to spare for the purchase of guano, bone dust, &c., I concluded to try what could be done at home. With a team and man, we commenced drawing muck from a pond, and, in four days, had one hundred loads on two acres of ground. The ground was again plowed, thus mixing the muck, and on the 15th of September was sown with wheat. It was harvested the following July, and when threshed and exhibited at the County Agricultural Fair, received the premium for being the best wheat exhibited. The next season the plot was sown with oats, and such a crop was never raised on the *old homestead*, and all without any other manure. This season we have put *eight hundred* loads on five acres, sown to wheat and rye, and expect to be able to give you and the farming community as good a report, if not better, from the crops next summer. In addition to the above, on the first lot, we this summer cut, per acre, three tons of as good timothy hay as was ever housed, and up to this present writing, the feed is good, and cows easily fill themselves from it daily. Let every farmer, who can, try an acre with muck, and he certainly will be repaid four-fold.—*American Agriculturist.*

THE POTATO DISEASE.

The Royal Agricultural Society has awarded a purse to Dr. Lang, of Ipplepen, for a paper on the Potato, its cultivation, production and disease. The conclusions at which he arrives are :

"That the disease is of a fungoid nature increased in virulency by atmospheric causes. That all manures are injurious, saving only lime and salt. That the earliest Potatoes in ripening should be exclusively grown. That earthing up repeatedly with fine earth is the only effectual preventive to the ravages of the disease."

"These opinions," says the London Gardener's Chronicle, "are much the same as those which have been repeatedly exyressed by ourselves, with the exception of recommending lime and salt as a manure, and trusting to frequent earthing up. But we must express our entire dissent to the author's statement that disease never originates in the lower portion of the stem where it adjoins the root. We can only say that during 13 years that we have studied the phenomenon of this singular malady we never saw an instance to the contrary."

MANAGEMENT OF WOOD LOTS.

This wintry weather reminds us both in city and country, that fuel in some shape is an article of the first necessity. And whether our thoughts go back to the open fire-place, and reminiscences of sober comfort there enjoyed, or fly away to the mines of carbon stored so many ages for after use, there is no question that the management of wood lots deserves consideration. The high prices of this product everywhere throughout the country, save in the wilderness itself, incites us to thought on the sources of supply, and the best means of its increase and preservation.

Dense forests once covered our State, and in the march of the pioneer, his sturdiest enemy seemed the old thick standing trees which hid the fertile valleys from the sunlight. His work and his true policy was to clear away a portion of this growth that he might plant and sow and gather food and wealth from the virgin soil. Through the long winter he plied the axe, and the towering trees crashed often to the earth, and the skies of spring and summer were hazed by the smoke each day, and reddened by the glare each night of burning logs, which would have sufficed to heap the hearths of a city with fuel. Only the most valuable lumber was saved, and year after year the work went on as long as the forests dared cast their morning or evening shadows on his humble roof-tree.

Now, a different state of things prevails, and there are thousands of farmers who buy far more wood than they sell—thousands to whom the value of our forests are coming home, as timber for lumber, fences and fuel yearly rises in value. There has unquestionably been some mis-management of our ressources, and we will devote the remninder of this article to a few practical hints on the time of cutting, as related to the sprouting and after-growth of wood lots, and also to planting the same.

The season of the year when forests are cut off has long been known to influence the after-growth, and it may be observed by any farmer that certain stumps in his wood lot sprout again freely, while the stumps of other trees send out few or no shoots, and soon decay. This fact is found to be little influenced by the kind of timber, but seems to depend mostly on the time of cutting; and experiments show that trees cut in spring when the sap flows most freely, almost invariably sprout again and send up a flourishing growth.

If one would bring on, then, a new growth of trees, let him cut the old at this season, and cut them near the ground, that the shoots may have a better chance; while if it is desirable to clear off a forest, it should be cut when the sap does not flow, and at that time it is said the timber proves most durable.

Whether it is best to cut only the full-grown trees, leaving the young and

thrifty, or to cut every tree as we go, is a point about which woodmen dispute. Those who advise the latter, say that as the new trees start up, all have an equal chance, and make a handsome growth, and will be many more in nomber than when only the young and vigorous are left. In that case, they must shade the ground to the discouragement of any new growth; and on the whole it would it would seem the wiser way to "cut clear" year after year as we go, and, if course rotation extends for fifteen or twenty years, we shall find as good a crop on that first cut as it formely yielded. Of course all browsing stock, fires, and prowling timber thieves must be kept away.

Most of our present farm wood lots may be increased in value by planting the openings to young trees, and by en couraging new growths, which heretofore in most instances, have been destroyed by permitting cattle and sheep to browse the forest pastures. There are also on many farms some acres of broken ground, difficult of cultivation on that account, which ought always to be kept in wood. Where they have been cleared they may be planted again to such trees as the soil seems best adapted to produce. Many New-England hills, in the long settled neighborhoods, have thus been clothed in verdure, and instead of being barren and worthless to the owner, they now bear a crop worth hnndreds of dollars the acre, and yearly increasing in value.

Grazier and Breeder.

WHAT IS PERFECTION IN CATTLE.

We doubt whether there is any person living—man, woman, or child however ignorant or learned, or whatever may be his profession—who has not established in his own mind the *beau ideal* of a bull, an ox, and a cow. But call upon persons to define this *beau ideal*—this perfect animal—and not one in a million can do it, and then that one in the million will in all probability be oftener wrong than right. Why? Because, however many cattle the said person may have handled and bred, he has, after all, no *exact scientific notions* on the subject—no rule, or in other words, no *scale of points* by which to be guided in judging of the perfections or imperfections of an animal. We have long felt that until a *scale of points* could be established to guide judges at Cattle Shows in their decisions, there would not only invariably be great dissatisfaction on the part of the Exhibitors in the decisions of the judges, but it would be utterly impossible for breeders themselves to make the improvements in their animals, which otherwise they would be enabled to accomplish. They are now like a fleet of vessels on the broad ocean—without quadrant or compass, and under orders for the *best port* in the country, and no instructions what that "best port" may be, but every Captain allowed to decide the port for himself.

We have hoped for several years past, the Agricultural Society would take up this subject and establish *a scale of points*; and we have endeavoured repeatedly to get those breeders abroad with whom we are acquainted to move in the matter; but as yet we have met with no success. If England, however, be not willing to do so, it is no reason that America should stand still. We, therefore, after much hesitancy, and consulting with some of the best breeders, give the following rude outlines for the formation of a scale of points, which shall be the criteria to judge of and regulate the breeding of Cattle. We hope it may have the happy tendency to set breeders thinking on the subject, trusting

hereafter that a convention of them may settle on something which shall prove an infallible guide to regulate their movements in producing cattle. In reading over this *scale*, many will ask, why is this article put down at 1, or that at 4, or that at 6, &c. ? The true reason of the difference in numbers is that there should be in the points designated, a harmonious combination of more or less good qualities or properties, which constitute a greater or less degree of excellence in the animal ; and as these points fall from, or approximate to a perfect standard, do they constitute the degrees of perfection required. We can only answer for the present, that it requires a volume to give reasons, and after all, we could not explain ourselves fully ; for in order to make a good breeder, a person must have a *natural talent* for such things, the same as for Mathematics, oratory, music or painting ; precept and practice with him must then go along together. The best of us may study and practice our whole lives in breeding animals, and then we have a *great deal to learn.*

Scale of Points for Short Horn Breeds.

	Points.
ART. 1.—Purity of Breed on male and female side ; sire and dam reputed for docility of disposition, early maturity, and aptitude to fatten, sire a good stock—getter. Dam a good breeder, and giving a large quantity of milk, or such as is superior for making butter and cheese	4
ART. 2.—Head muscular and fine. The horns fine and gradually diminishing to a point ; of a flat rather than a round shape at the base ; short and inclined to turn up ; those of a clear waxy colour to be preferred, but such as are of a transparent white slightly tinged with yellow, admissable. Ears small, thin, and covered with small soft hair ; palying quick, and moving freely. Forehead short and broad, especially between the eyes, and slightly dished. Eyes bright, placid, and rather prominent than otherwise, with a yellow rim round them. Lower part of the face clean, dished, and well developing the course of the veins. Muzzle small. Nose of a clear orange or light chocolate colour. Nostrils wide and open. Lower jaw thin. Teeth clean and sound.....	5
ART. 3.—Neck fine, and slightly arched ; strongly and well set on to the head and shoulders ; harmoniously widening, deepening and rounding as it approaches the latter point. No dewlap.....	2
ART. 4.—Chest broad, deep and projecting—the brisket on a lower line than the belly.....	5
ART. 5.—Shoulders broad, strong, fine, and well placed. Fore legs short, straight, and standing rather wide apart than narrow. Fore arm muscular, broad, and powerful ; slightly swelling and full above the knee ; the bone fine and flat. Knees well knit and strong. Foot flat, and in shape of an oblong semicircle; horn of the hoof sound and of a clear, waxy colour.....	2
ART. 6.—Barrel round and deep, and well ribbed up the hips.....	
ART. 7.—Back short, strong, straight and broad from the withers to the setting of the tail. Crops round and full. Loins broad. Huckle bones on a level with the back. Tail well set, on a level with the back, or very slightly below it ; fine and gradually diminishing to a point, and hanging without the brush an inch or so below the hock, at right angles with the back.....	4

ART. 8.—Hind quarters from the huckle to the point of the rump long and well filled up. Twist well let down and full. The hind legs short, straight, and well spread apart ; gradually swelling and rounding above the hock ; the bone fine and flat below. Foot flat, and in shape making an oblong semicircle. Horn of the hoof sound, and of a clear waxy colour. Legs not to cross each other in walking, nor to straddle behind..... 3

ART. 9.—Skin of a medium thickness ; moveable and mellow ; a white colour is admissible, but a rich cream or orange much preferable. Hair well covering the hide ; soft and fine, and if under-coated with soft, thick fur in the winter, so much the better. Colour, pure white, red roan, bright red, or reddish yellow and white. (A Black or Brown Nose or rim round the eye ; black or dark spots on the skin and hair decidedly objectionable, and indicative of coarse meat and bad blood).. 3

ART. 10.—Good handling..... 4

ART. 11.—Sure Stock—getter..... 4

ART. 12.—Stock, when made steers, certain to feed kindly for beeves at any age, and make prime beef..... 5

ART. 13.—General appearance..... 2

Perfection..... 50

Scale of Points for Short Horn Cows.

ART. 1.—Purity of breed on male and female side ; sire and dam reputed for docility and disposition, early maturity and aptitude to fatten. Sire a good stock—getter. Dam a good breeder : giving a large quantity of milk, or such as is superior for making butter and cheese..... 7 *Points.*

ART. 2.—Head small and tapering ; longer and narrower in proportion than that of the bull. Horns fine and gradually diminishing to a point ; of a flat rather than of a round shape at the base ;—short and inclined to turn up ; those of a clear waxy colour to be preferred, but such as are of a transparent white slightly tinged with yellow, admissible. Ears small, thin, and well covered with soft hair; playing quick and moving freely. Forehead of good breadth between the eyes, and slightly dished. Eyes bright, placid, and rather prominent than otherwise, with a yellow rim round them. The lower part of the face clean and well developing the course of the veins. Muzzle small ; nose of a clear orange, or light chocolate colour—the former much preferred. Nostrlls wide and well opened. Lower jaw thin. Teeth clean and sound..... 5

ART. 3.—Neck fine and thin, straight, and well set on to the head and shoulders, harmoniously widening, deepening and slightly rounding in a delicate feminine manner as it approaches the latter point. No dewlap..... 2

ART. 4.—Shoulders fine and well placed. Fore legs short, straight, and well spread apart. Fore arm wide, muscular, slightly swelling, and full above the knee ; the bone fine and flat below. Knees well knit and strong. Foot flat and in shape of an oblong semicircle. Horn of hoof sound, and of a clear waxy colour..... 2

ART. 5.—Chest broad, deep and projecting—the brisket in a lower line than the belly..... 5

ART. 6.—Barrel round, deep, and well ribbed to the hips.....	4
ART. 7.—Back short, strong and straight, from the withers to the setting of the tail. Crup round and full. Loin broad. Huckle bones on a level with the back. Tail well set, on a level with the back, or very slightly below it ; fine and gradually diminishing to a point ; and hanging without the brush, an inch or so below the hock, at right angles with the back.....	4
ART. 8.—Hind quarters from the huckles to the point of the rump long and well filled up. Twist well let down and full. Hind legs short, straight, and well spread apart ; gradually swelling and rounding above the hock ; the bone fine and flat below. Foot flat and in shape of an oblong semicircle. Horn of the hoof sound and of a clear waxy colour. Legs not to cross each other in walking, nor to straddle behind..	3
ART. 9.—Udder broad and full, extending well forward along the belly, and well up behind. Teats of a good size for the hand ; squarely placed with a slight oblique pointing out ; wide apart ; when pressed by the hand the milk flowing from them freely. Extra teats, indicative of good milking qualities, but should never be milked, as they draw the bag out of shape. Milk veins large and swelling. Milk excelling either in quantity or quality for making butter or cheese.....	5
ART. 10.—Skin of a medium thickness ; moveable and mellow ; a white colour admissable, but a rich cream or orange much preferable. (We speak of the bare skin beneath the hair.) It is believed as a rule that cows with a cream coloured skin yield the richest milk. Hair well covering the hide ; soft and fine, and if under coated with soft, thick fur in the winter, so much the better. Colour pure white ; red roan ; bright red ; red and white ; spotted roan, or reddish yellow and white. (A black or dark brown nose, or rim round the eye ; black or dark brown spots on the skin and hair decidedly objectionable, and indicative of coarse meat and bad blood).....	3
ART. 11.—Good handler.....	4
ART. 12.—Sure and good breeder.....	4
ART. 13.—General appearance.....	2
Perfection.....	50

THE FEEDING OF HORNED AND POLLED CATTLE, AND THE PRODUCTION (OR MANUFACTURE) OF BUTCHERS' MEAT.

In the first part of our introductory Article on this subject in the January Number of *the Journal*, we explained the construction of the peculiar apparatus which elaborates the food sent into it. We shall now consider what are the constituent parts of the food which are required to support and increase the particular parts of the body, and we do not think we can do better than extract for the purpose the plain and accurate explanation given by our old friend Henry Stephens, F. R. S. E. We shall continne our own remarks on this very important subject, so well adapted to the present season, in future numbers of the Journal.

J. A.

The animal body, we all know, is made up, in a general sense, of a hard bony skeleton, which forms the frame work that acts as a support to the rest of the body. Bone is found, by chemical analysis, to consist of 65 per cent of mineral matter, chiefly phosphate of lime. Upon and attached to this bone are large masses of fibrous flesh, which constitute the muscles of the body.—About 77 per cent of this muscle consists only of water, and the remaining 23 per cent is composed chiefly of fibrin, the characteristics properties of which are supposed to be derived from the large proportion of nitrogen which it contains —about 16 per cent. Large quantities of fat are found dispersed over all parts of the animal body. It is found to be composed chiefly of carbon. The intestines, nerves, veins, are composed chiefly of fibrous matter. Of the juices of the body, the largest proportion consists of water, and of the fluids, the blood composes the largest proportion, and the dry part of the blood has much of the same composition as fibrin.

Now, you have seen, (from what we stated in previous articles of the composition of the several vegetable productions, the subjects of culture, that they contain principally starch and sugar, which consists of carbon, hydrogen and oxygen (all described in a previous article,) and the protein compounds, which last comprehend all the substances which contain nitrogen, such as albumen, fibrin, casein, gluten. And the composition of the ash of such of the vegetable substances as has been given, indicates that it is composed principally of lime, phosphoric acid, and the alkalies, potash and soda. So that the vegetables and grains raised on the farm, contain, in their composition, all the materials necessary to form all the water, bone, fibrin, fat and fluids, which compose the animal body.

In the application of these substances to the peculiar state of the animal economy, it should conform with reason to give such of them as contain phosphoric acid and lime most abundantly to *young animals*, because they are still forming their bones, and will, until the skeleton is fully developed. The substances which supply fibrin freely should be given to animals of all ages, as the enlargement of muscle is one of the principal objects of the breeder of live stock. And those substances which supply fat should chiefly be given, when it is desired to fatten the animals for the butcher or domestic use. This seems a very simple view of the rearing and fattening of animals ; but in practice it is not so easy as it is simple in theory, for the vital principle often interferes very influentially with the desired results, by creating differences in the constitution of animals reared exactly under similar circumstances, as to give so complete a base to the results as evidently to place the forming of the condition of any particular animal almost beyond our control. Still, as much of the result accords with expectation as to encourage us to persevere in the improvement in the rearing and fattening of our live stok.

As no one has done so much of late years to explain the process of digestion, and, in consequence, to establish the practice of feeding animals upon rational and truly scientific principles, as the now famed Liebig of Gessen in Germany, it is but fair to give his views on the subject, and which I find ably done to my hand by Dr. Gregory of Edinburgh in his edition of a recent work of great merit. "The life of Animals," he says, is distinguished from that of vegetables by the circumstance, that by animals, oxigen is constantly absorbed and replaced by corbonic acid, while, by vegetables, carbonic acid is absorbed, its carbon retained, and its oxygen given out. Consciousness and the power of locomotion, are peculiar to animals. In animals, two processes are constantly carried on—that of respiration, by which the animal heat is kept up ; and that of nutrition, by which the matter consumed in the vital functions, and expelled from the body, is restored. Respiration is essentially a combustion of carbon and hydrogen which, in combination with oxygen, are converted into carbonic acid and water,

and at the sametime furnish the annual heat. Liebig calculates that the amount of carbon daily burned in the body of an adult man is about 14 ounces, and that the heat given out is fully sufficient to keep up the temperature of the body, and to account for the evaporation of all the gaseous matter and vapour expelled from the lungs. This carbon is derived, in the first place, from the tissues of the body, which undergo a constant waste, but alternately from the food.

The tissues can only be decomposed from the exercise of the vital functions, and the food of the herbivora contains little of the aluminous compounds, only sufficient to restore the waste of the tissues ; while the carbon required for respiration is supplied by the starch, gum, sugar, oil, &c., which form the great mass of their food, and no such amount of muscular motion is required in them as in the carnivora. It is in the form of bile chiefly, that the carbon undergoes combustion. Hitherto the true functions of the bile has been disputed. The tissues, which are consumed, are resolved first into bile and urate of ammonia. The former is secreted from the bile, and reabsorbed and burned. The latter, in serpents and birds, is expelled unchanged ; but in man and quadrupeds in whom the amount of oxygen inspired in much greater, it also is oxydised, yielding finally carbonic acid, ammonia, and urea. The urine of the herbivora differs from that of man, in containing, besides urea, much hippuric acid, when they are at rest or stall fed, and benzoic acid when they are in full exercise, and when, consequently more oxygen is supplied. The bile of the herbivora is much more abundant than that of the carnivora—an ox secreting, according to Burdach, 37lbs. of bile daily. As the waste of matter in the herbivora is but limited, it is obvious that it cannot supply all the bile, and, consequently, a great part must be derived from the starch and other new azotized constituents of ther food, which lose oxygen, and enter into combination with some azotised product of the decomposition of the tissues. Soda is unnecessary for the formation of the bile, and is supplied in the form of common salt : when the supply of soda is defective, the metamorphosis of alluminous compounds can yield only fat and urea. In the urine of the herbivora, soda is present in far larger quantity than that of the carnivora, and combined with carbonic, hippuric, or benzoic acid. This shows that the herbivora require a far greater amount of soda than is contained in the amount of blood—constituents daily consumed, which in them is small ; and this soda is obtained from their food, and employed in producing their abundant bile. The plants on which the herbivora feed cannot grow in a soil destitute of alkalies ; but these alkalies are not less necessary for the support of the animals than of the plants. The soda is found in the blood and bile ; and the potash is now known to exist in large quantity in the juice of flesh, and to be absolutely essential to the production of bone in the animals which feed on these plants. It is impossible not to be penetrated with admiration of the wisdom which is shown in these beautiful arrangements.

"Let us now consider the changes which the food undergoes in the process of digestion. When the food has entered the stomach, the gastric juice is poured on it, and after a short time the whole is converted into a semifluid homogeneous mass, the chyme. Many researches have been made to discover the solvent contained in the gastric juice, but in vain. It contains no substance which has the property of dissolving fibrin, albumen, &c., we are compelled to adopt the opinion of Liebig, according to which the food is dissolved in consequence of a metamorphosis analogous to fermentation, by which a new arrangement of the particles is effected. As in fermentation, the change is owing to the presence of a body in a state of decomposition or motion, what is propagated from the ferment to the sugar in contact ; so, in digestion, the gastric juice contains a small quantity of a matter derived from the living menbrane of the stomach, which is in a state of progressive change ; and the change or motion is

propagated from this to the particles of food, under certain conditions, such as a certain temperature, and, as it now appears, the presence of a free acid, which is phosphoric or lactic, or both. Besides the gastric juice, the only other substances employed in digestion is the oxygen which is introduced into the stomach with the saliva, which, from its viscidity, incloses a large quantity of air. The chyme then leaves the stomach, and gradually passes into the state of chyle, which resembles blood, except in colour, being already alkaline, not acid like the chyme. By means of the circulation, oxygen is conveyed in the actual blood to every part of the body. This oxygen acting on the tissues destined to undergo change, produces a metamorphosis by which new soluble compounds are formed. The tissues thus destroyed are replaced by the new matter derived from the food. Meantime, those of the products of metamorphosis which contain the principal parts of the carbon, are seperated from the venous blood in the liver, and yield the bile; while the nitrogen accumulates, and is separated from the arterial blood in the kidneys in the form of urea or uric acid.

"The blood has another important function to perform, namely, to convey for excretion to the lungs the carbonic acid formed in the extreme vessels or cells in all parts of the body. There is reason to believe that the globules of blood possess the property of absorbing oxygen in the lungs, when they become arterial, and thus convey this oxygen to all parts. The globules then give up the oxygen to the particles of the tissues undergoing change, and in its stead carbonic acid is taken up, and the blood becomes venous. It is not known what chemical compound in blood absorbs and carries the oxygen, but it is by some conjectured to be a compound of iron analogous to the protoxide. It is certain that air is indispensable to the blood, and it is remarkable that sulphuretted hydrogen and hydrocyanic acid both instantly destroy the power of the blood to perform its functions—hence their horrible energy as poisons, when inhaled. Now, these compounds both act on protoxide, protocloride, and other analogous compounds of iron, immediately depriving them of their characteristic power of acting on oxygen.

"With regard to the carbonic acid which is produced in all parts of the body in the continual metamorphosis of the tissues, Enderlin has proved that blood contains no carbonates whatever; and Liebig has since recently pointed out that the required properties exist in a still higher degree in the phosphate of soda, which does exist in the blood, and appears to be altogether indispensable to its existence, No salt known is so well adapted for this function. It is truly remarkable that, while both phosphate of soda and phosphate of potash exist in the food, the former alone should occur in the blood; and this is especially wonderful when we consider that the juice of the flesh, which is only separated from the blood by various thin membranes, permeable to liquids by endosmose and exosmose, contain much phosphate of potash, and little or no phosphate of soda. It is evident that the vessels or cells must possess in their peculiar membranes a power of secrection, or of allowing some salts to pass in one direction only, and others in the opposite.

There can be no doubt that the function of the acid salt, the phosphate of potash, in the juice of the flesh, and apparently also in the gastric juice, is as important as that of phosphate of soda in the blood. Probably a part of that function is to insure the constant acidity of their fluids, as phosphate of soda does the custant and essential alkalinity of the blood, in which the power of abording and giving out carbonic acid—in other words, respiration—depends. And we see too, that if this be so, the phosphate of potash, of the juice of the flesh, and of the gastric juice, cannot be replaced, as far as its functions are concerned, by phosphate of soda.

Another probable function of the substances which give acidity to the juice of

the flesh, and alkalinity to the blood, is the production of electric currents. It has been shown by Matteucci that such currents exist in the body; and we can easily see how they arrive when we observe the fluids in contact with muscle and with nervous matter. At the request of Liebig, Ruff constructed piles of discs of pasteboard steeped in blood, with slices of muscle and brain, which showed a powerful current from the blood to the muscle.

Since no blood can be formed without soda, no animal could live if confined to such inland plants as contain only potash. It is well known, indeed, that animals far inland, as Bavaria, are habitually supplied with common salt, either in substance or in the form of salt springs. Of both they are instinctively fond. But fortunately salt is found in, even inland countries, in all soils and in all natures, and consequently in most plants. Were it altogether absent, no blood could be formed, unless salt or soda were artificially supplied to every animal. All inland plants contain earthy phosphates, and phosphates of potash, in variable proportions, often with mere traces of the compounds of sodium. When these phosphates act as common salt (cloride of sodium,) there are formed cloride of potassium, and the common alkaline chloride of sodium, which last salt is absolutely indispensable to the formation of the blood. The chloride of potassium is found in the juice of the flesh.

It is truly a spectacle worthy of admiration, to see the essential properties of two of the animal fluids—the blood and the juice of the flesh—thus secured by a difference, at first sight altogether insignificant, between the relation of phosphoric acid to two alkalies, which so much resemble one another that they may be mutually replaced, each by the other, in a multitude of cases—nay do actually replace each other in many plants. The reader will not fail to remark, how emphatically these facts impress upon us the necessity of attending carefully to the most minute characters of all the compounds which can be found among the elements composing the organic kingdom, even when these characters appear, at the time, to have no considerable relation to the vital processes.

The researches of Dr. A. D. Thomson have demonstrated, that the most favorable proportion between the alluminous or azotised, and the saccharine or not azotised constituents in the food of animals, is that of 1 part by weight of the azotised to 7 or 8 of the saccharine. This proportion exists naturally in the most nutritious food such as grain, while in such food as potatoes, the amount of albuminous matter is much too small. Hence potatoes alone must be regarded as very inferior in nutritive power to wheat, oats, rye, or maize, equal weights being compared.

There is another constituent of the animal body, namely, fat, the production of which deserved notice. It is not an organised tissue, but is formed and collected in the cellular tissue under certain circumstances. These are, rest and confinement, that is, a deficiency of oxygen, and an abundance of food containing a considerable proportion of non-azotised matter, such as starch, sugar, &c. Now the chief source of fat is sugar, the composition of which is such, that when deprived of oxygen, fat remains. It is, therefore, obvious, that fat can only be formed by a process of deoxidation. But it is produced when oxygen is deficient; and it appears, as Liebig has pointed out, that, when there is a deficient supply of oxygen, the production of fat, which is the consequence of the deficiency, yields a supply of that element and thus serves to keep up the animal heat and the vital functions, which would otherwise be arrested. This is another beautiful instance of contrivance equally simple and wonderful. That fat must be formed by the deoxidising process is proved by the phenomena of the fattening of animals. A goose tied up, and fed with farinaceous food, altogether destitute of fat, acquires in a short time an increase of weight of several pounds, the whole of which is fat. Again, the bee produces wax, a species of fat, from pure sugar.

With regard to the production of nervous matter, which animals alone can form, we see, from its composition, intermediate between that of albumen and fat, that it may be formed, either by depriving albuminous of some azotized product, or by adding to fat an azotised compound. Where it is formed we do not know, but it must be formed in the animal body; and Liebig has suggested, that the power of the vegetable alkalies to effect the nervous system may be owing to their composition, which approches nearer to that of nervous matter than any other compounds. These alkalies may promote or check the formation of nervous matter, and thus produce their peculiar effects.

These observations tend to show, that we may expect in progress of time to explain a large class of phenomena connectedwith animal life on chemical principles. We cannot do so yet, notwithstanding the plainness of the views, propounded by Liebig. He may have opened up the true path, but it is for experimenters to pursue it with research and perseverence, in order to confirm or refute his views. As yet, philosophers are by no means agreed as to the circumstances which regulate the process of digestion; some would ascribe our ignorance of it on account of the intricacy of the subject, the obscurity which attends it, and the deficiency of observation as to the true nature of the process; whilst others regard the process as simple, referring the preparation of the food in the stomach to the presence of an acid in that organ, which dissolves the food, and enables it to enter as a constituent of the circulating fluids of the animal system. The acid which affects this important object is the hydro-chloric acid, which they consider to have been satisfactorily proved to be present-during the period when food exists in the stomach; and they conceive they can imitate the process of animal digestion in glass, or other vessels of the body, simply by exposing animal and vegetable food to the influence of dilute acids. The subject is not so very simple in nature as it would seem to be when conducted in a glass vessel. There are indications, no doubt, of the direction in which we are to search for a solution of the difficulties of the subject, but we are still at a great distance from the elucidation of the precise manner in which animals digest their food.

"There cannot be a doubt, as Dr. R. D. Thomsom observes "that if we understood the nature of the process by which the food which we swallow is converted into living flesh, important results would follow in reference to the preservation of the health of animals, and the treatment of the deseases. If we were properly acquainted with every transformation though which the constituents of the food pass, after it has been masticated, until it is finally removed from the system, it is clear that, in case the stomach is unable to perform its accustomed functions, the assistance of art ought to be called in to assist digestion." If Dr Thomson, who has experimented so largely on the subject, feels any difficulty in it, it must indeed be difficult. His own researches where conducted with a view to arriving at a practical result--namely the comparative effects of certain given articles of food on the fattening or secreting power of animals; and these seem to demonstrate that the fat of animals cannot be produced from the oil of the food, but must be evolved from the calorifiant or heat-forming portion of the animal essentially assisted by its nitrogenous materials. By following out this principle, he has been enable to detect one important relation, existing between the nutritive and colorifiant portion of the food, upon the determination of which, for the various conditions of animals, he considers the laws of animal dieting depend. He endeavoured to apply the law to various articles of human food, and he trusts that the basis has been laid for future researches, which may be directed to administer to the health and comfort of mankind, and of the demesticated animals. In conducting the experiments upon cattle, he found not only his habitual acquaintance with animals, but also his medical knowledge, in continual requisition, in consequence of the tendency of the varied condition of the animal system, from

the sudden and frequent changes of diet, to induce symptoms of desease. These were carefully watched and overcome, by such precautions as clearly follow from a close consideration of the principles announced in his work.

SMITHFIELD CLUB CATTLE SHOW.

There is a good deal of difference of opinion as to the merits of this year's show, some persons contending that it will not bear comparison with last year's and much less with that of the previous year, while others are equally strenuous in asserting that, although the number of animals exhibited, is less than on the last anniversary, quality this year makes up for quantity, and a higher general level of excellence is obtained than on any previous occasion. The number of entries in the different classes was as follows: Short-Horns, 42, the same as last year; Herefords, 26; Devons, 28, both considerably less than last year. Of cattle of cross or mixed breed, there was a large increase, there being no less than 23, or three times the number shown before. The other breeds amounted to 52, not quite so many as on the last occasion. Sheep muster about the same number of entries as last year—namely 123, and there were 58 pens of pigs, about equal to the previous show.

His Royal Highness, the Prince Consort, has carried off the head prizes both for young and aged Devon steers. The steer is a very compact animal, with a good back, flank, and thigh, and a handsome head. The Earl of Leicester's second prize steer will be considered superior by many; Mr. Farthing's has a larger frame, but it is not equal to these in quality. Mr. Farquharson's ox is of a great size for a Devon, but is no less than seven years old. His Royal Highness's prize ox is a very handsome beast, with a fat back, but certainly does not possess a first-rate loin and rump of beef. Mr. Overman's second prize ox in the same class is very evenly fed and especially handsome. Mr. Heath, of olden fame, takes only a commendation for an ox of great fame, very deep and heavy; but not having the extraordinary touch and quality of flesh of some others. Among the Devon Cows, Mr. Gibb's is certainly wonderfully well fed —her quality of flesh, first class. Mr. Heath gains the prize for Hereford steers with an animal of unusual merit, Mr. Niblett's and Captain Peploe's, being but little inferior. His Royal Highness is fairly beaten in this class, and wins only a commendation in the class of Hereford oxen, which formed a fine feature in the show. Mr. Swinnerton's prize ox is the second prize ox of the Birmingham show, and a good animal it is. Mr. Heath's would have stood a chance of victory, had it been somewhat better furnished behind the shoulder. Mr. Alderworth's, Mr. Oakley's, Mr. Shaw's and the Earl of Darnley's are exceedingly good beasts. The Hereford cows are meritorious as a class, some of them particularly fat. Mr. Hill's and Mr Higgins's are both good. Mr. Fisher Hobb's cow is also very handsome and nicely fed.

The shorthorns were so far superior to those of the Birmingham show, that the prize animals of last week have now been altogether eclipsed, except, indeed, that Mr. Stratton's magnificent Steer which took the first prize in its class there is now honored with the gold medal, The Earl of Radnor's and Colonel Pennant's, in the same class, are also of considerable merit. Mr. Marriott's prize ox is remarkably fine; and, indeed, Earl Spencer's, the Earl of Radnor's, the Marquis of Exeter's, and several other extremely good beasts make the shorthorn ox class very grand indeed. Mr. Brown's heifer, wenning the gold medal for

"the best cow or heifer," justly merits her honor, but was unfortunately affected by a contagious distemper, rendering necessary her removal from the yard. The shorthorn cows were wonderfully fine, as they always are. Mr. Swinnerton's cow is beaten by the splendid animal of Mr. Fletcher's and Mr. Barnett's is a great beauty.

The Sussex cattle made a good show. The Scotch classes were, as usual, indebted to the Duke of Beaufort for some good specimens, Mr. Martin and Viscount Hill being also successful exhibitors. In the mixed breed classes are many good beasts, principally crosses of shorthorns and other breeds. The show of sheep was uncommonly good. Mr. Jordan takes the gold medal for his Leicesters. Mr. Foljambe, the Marquis of Exeter, Lord Berners, Mr. West, and Mr. Hewer, showing particularly good sheep. Mr. Overman's beautiful cross-breeds are successful in two classes; the Duke of Richmond, Mr. Rigden, and Lord Walsingham take prizes with their most beautiful formed and handsome Downs. The show of pigs was also uncommonly good, it being impossible to find any ordinary animals among them.

The implement division of the exhibition comprises the steam-engines and threshing-machines of our principal makers, and the usual dense accumulation of chaff-cutters, mills, pumps, clod-crushers, &c., and the conspicuous stalls of seeds and roots, tastefully arranged. The principal novelties were Burgess and Key's new American grass-mover for cutting hay more closely than the scythe, Samuelson's American reaping machine, with a self-acting rake to deliver the cut corn in sheaf bundles, and an American corn-dressing machine for separating grain, on an entirely new principle an "exhaust" being combined with a blast and riddle. Models of Fowlers steam-plough and of Romayne's steam-digger are exhibited, and Mr. Smith showed some specimens of mangolds, grown on his steam-tilled farm at a wonderfully low cost for cultivation.

The prize for cattle, sheep, pigs, and extra stock were then awarded.

The show was opened to the public on Tuesday, and was well filled throughout the day, but there was no crowding or inconvenience of any kind.

The annual meeting of the club took place in the committee-room of the Bazaar, at one o'clock. Lord Berners, in the absence of the noble President, the Duke of Richmond, occupied the chair. Mr. John Beasley's resolution to define by the rules what is and what is not a pure bred animal, or how many crosses constitute a pure-bred and what qualifies it to be shown in the pure-bred beast, and what in the mixed classes, was agreed to; as was also Mr. Sanday's motion, "to appoint three more judges —viz., three for cattle, three for long-wooled sheep and pigs, and three for short-wooled and cross-bred sheep:" as well as a motion by Mr. Buckley, "That there be two medals instead of one in extra stock—viz: one for steers or oxen, and one for heifers or cows." The meeting, which was numerously attended, ultimately adjourned till Thursday. The sales effected during the day in the cattle classes were exceedingly slow, but in the sheep and pig classes the reverse was case.

The annual dinner of the members and friends of the Smithfield Club took place on Wednesday evening, at the Freemasons' Tavern, Great Queen Street, Lincoln's inn-fields, when upwards of 100 gentlemen participated in the festivities of the occasion. His grace, the Duke of Richmond, the President, occupied the chair, and was supported by Lord Berners, Vice-President; Mr. C. T. Tower, the Father of the Club; Mr. Alderman Mechi, Mr. Brandreth, Mr. Fisher Hobbs, Mr. C. Barnett, Mr. R. Milward, Mr. H. Wilson, Mr. K. Westbrook Baker, Professor Simmonds, Mr. Sanday, Mr. Torr, Mr. Quartly, Mr. James Webb, Mr. John Hudson, Mr. Druce, Mr. B. E. Bennett, Mr. B. T. Brandreth Gibbs, the Honorary Secretary, and a large number of eminent agriculturists.—*Ladies' London Paper.*

RULES FOR SELLING SHEEP.

"The character of a flock depends very much on the practice of the owner in making sales," says an experienced sheep farmer in writing to the *Ohio Cultivator*, and he adds some valuable suggestions on the subject, which we condense below:—

Never suffer a purchaser to take the pick of your flock, but do the picking yourself. Try ro pick when you buy—be sure and pick when you sell.

Always sell ewes in the fall—selecting for that purpose, first, such as are getting old, next such as are, in any particular, defective. By this means a flock of ewes is always right, and looking right. Never suffer a sheep to get old on the farm, unless perhaps a very choice buck or breeding ewe.

In the sale of weathers be governed by circumstances. Pasture scarce, we sell in the spring after clipping. Pasture plenty and winter feed scarce, we sell in the fall. Pasture and feed abundant, we fatten for the drovers or butches in March or April—never permitting wethers to get over three years old before selling them.

By this means the flock is made to consist always of young, healthy and thrifty sheep. Better that old sheep should be sold at half their value, than good young thrifty ones at half price.—*N.-Y. Tribune.*

GROSS AND NET WEIGHT OF CATTLE.

The ordinary rule of ascertaining the net weight of beef cattle from the live weight on the scales, varies according to quality, size and age, and after all is no rule at all, because it is entirely a matter of agreement between the parties at the time.

It also depends upon the locality. In New-York, the net weight of the beef in the quarter only is wanted. In Boston, the bide and fat are included, counting those products equal to one-quarter of the beef, or rather, calling the whole five quarters. There the net weight of a fat bullock is estimated at 60 to 68 pounds of each 100 of live weight. In extra fine animals the percentage is higher.

In New-Youk, where the hide and fat are left out of the calculation, the bullocks are estimated at 55 to 60 pounds net to each 100 pounds gross; and if the animal is very fine, the estimate runs from 61 to 64 pounds net to each 100 pounds gross. Extraordinary animals sometimes dress 65 or 66 pounds, and even higher, and ordinary and lean stock run from 55 down to 47, though not often below 50 pounds, or one-half the live weight at home. The common practice at the West is to weigh fatted cattle, some hours after feeding and a little exercrse, and calculate the net weight at 55 pounds per 100 of the live weigh.—*N.-Y. Tribune.*

Gross and Net Weight of Sheep.—A few years ago we ascertained the live and dead weight of a large number of sheep slaughtered for the tallow near the city, and found that the carcass weighed about *three-fifths* of the live weight. These were common sheep, affording only about twelve pounds of tallow. Had they been in better condition, they would have afforded a higher proportionate weight of carcass.

In England with the coarse-woolled mutton sheep, fatted for the butcher, it is generally estimated that a stone live weight (14 lbs.) will give a stone dead weight (8 lbs.) The live weight (ascertained after the sheep have fasted for twelve hours) is divided by seven, and this gives the weight of the carcass in quarters. Thus a sheep weighing 140 lbs. alive, is estimated to weigh 20 lbs. per quarter. We have known whole flocks to exceed this estimate. The fatter the sheep, the greater the dead weight in proportion to the live weight.—*Genesee Farmer.*

THE IMPORTANCE OF ROOT CROPS.

Several of our intelligent correspondents are amusing themselves, in giving expression to their views in relation to *the value and importance of root crops*, in our farm economy. Their opinions—as the careful reader has undoubtedly observed—are widely different. That they are sincere opinions, we can have no doubt—and we have as little doubt that there existed widely different circumstances between the parties, which led to the different conclusions to which they severally arrived.

For many years, our own opinions were unfavorable to the culture of roots as feed for stock; but they were founded more upon the general expression of those around us, than upon investigation and use of them under our own labor and supervision. When we had gone through with these, we became convinced that we were in error, and that the "general expression of opinion around us," to which we have alluded had no better basis than the views we had entertained.

The successful culture of roots requires more plowing and harrowing, and preparation generally, than our corn or grain crops, and more care in tending them after the seed is committed to the ground. It is more delicate work—requiring more thought and skill and more exactness of arrangement, and all this is what farmers generally have disliked,—and hence the opinion naturally enough grew up, that the culture of beets, turnips, mangolds, &c. was unprofitable as food for stock.

The discussion of our correspondents has prompted us to look again at some of the statements made in regard to these crops, and we find the highest testimony in their favor in abundance, both at home and abroad.

In the *London Quarterly Review* for April last, is a long article reviewing five or six works upon agricultural subjects, in which we find statements having a direct bearing upon our subject. In speaking of the conditibn of English agriculture at the close of the eighteenth century, the writer says:—

"The greater number of breeds were large headed and ill-shapped, greedy eaters, and slow in arriving at maturity; while as *very little winter food, except hay, was raised*, the meat laid on by grass in the summer was lost, or barely maintained, in winter. Fresh meat for six months of the year was a luxury only enjoyed by the wealthiest personages. Within the recollection of many now living, first-class farmers in Herefordshire salted down an old cow in the autumn, which, with flitches of fat bacon, supplied their families with meat until the spring. Bedel Gunning, Esquire in his "Memorials of Cambridge," relates that when Dr. Makepeace Thacheray settled in Chester, about the beginning of the present century he presented one of his tenants with a bull-calf of a superior breed. On his inquiring after it in the following spring, the farmer gratefully replied, "Sir, he was a noble animal; we killed him at Christmas, and have lived upon him ever since."

We have underscored the words "*very little winter food, except hay, was raised*," to show, as one reason why the cattle were worthy of the discription given them.

After speaking at considerable length of the changes effected in the breeds of cattle and sheep, and the light thrown upon these subjects by the investigations of ARTHUR YOUNG, COBBET, ROBERT BAKEWELL, and others, the writer says:

"But the fattening and early maturity of the improved stock would have been of little value beyond the few rich grazing districts of the Midland counties, without an addition to the supply of food. The best arable land of the kingdom had been exhausted by long years of cultivation, and the barren fallow, which

annually absorbed one-third of the soil, failed to restore its fertility. A new source of agricultural wealth was discovered in turnips, which, as their important qualities became known excited in many of their early cultivators much the same sort of enthusiasm as they did in Lord Monboddo, who on returning home from a circuit, went to look at a field of them by candle-light. Turnips answered the purpose of a fallow crop which cleaned and rested old arable land ; turnips were food for fattening cattle in winter ; turnips, grown on light land, and afterwards eaten down by sheep which consolidated it by their feet, prepared the way for corn-crops on wastes that had previously been given up to the rabbits."

Under this system, a Mr. Rodwell made the produce of 220 acres of land worth *one hundred and fifty thousand dollars more* in twenty-eight years, than his predecessor did in the same time, under the old system, without roots. This great advance in arable farming took its rise in the county of Norfolk. Again—

"Turnips, which are said by Young to have been brought into farm cultivation by the celebrated Jethro Tull, found such a zealous advocate in Lord Townshend, that he got the name of 'Turnip Townshend.' Pope speaks of 'all Townshend's turnips,' in one of his imitations of Horace, publlished in 1737. This crop he had the sagacity to see was the parent of all the future crops. Without winter food little stock could be kept, without stock there could be liltle manure, and with little manure there could not be much of anything else. The turnips were, therefore' employed to secure a large dung-heap, and the dung-heap in turn was mainly appropriated to securing the largest possible store of turnips. This tillage in a circle was as productive as it was simple. The ground, cleaned and enriched by the root-crops, afterwards yielded abundant harvests of corn ; and as we have already stated, the treading of the sheep upon the loose soil, while they fed off a portion of the turnips, gave it the necessary firmness. Thus through the agency of turnips a full fold and a full bullock-yard made a full granary. Essex and Suffolk soon copied the method. bnt they did not carry it so far as in Norfolk ; and in many places the turnips were never thinned or hoed, upon which their size and consequently nearly all their value depended."

With a single extract more we will leave this highly interesting and instructive article, hoping at a future time to show equally as decided testimony in favor of root culture, in the practice of our own people.

"In the old days distance operated as a barrier to imitation, and three-fourths of England only heard of what was done in the well-cultivated fourth to ridicule and dispste it. When the father of Mr. George Turner, of Barton, Devon, the well-known breeder of Devon Cattle and of Leicester sheep, who had learned something in his visits with stock to Holkham, began to drill turnips, a well-to-do neighbor looked down from the dividing bank and said to his son, 'I suppose your father will be sowing pepper out of a cruet next.' Indeed, the whole history of the turnip cultivation affords a characteristic contrast between the spirit of the past and the present. It took upwards of a century to establish the proper growth of this crop, notwithstanding that the wealth of meat and corn which proceeded from it was as plain to those who would open their eyes as that a guinea was worth one-and-twenty-shillings. The first difficulty was to persuade farmers to try it at all ; and not one turnip was ever seen ou a field in Northumberland till between 1760 and 1770. The second difficulty was to get them to be at the expense of hoeing, insomuch that Young said that he should be heard with incredulity in most counties when he bore testimony to the vast benefiits which were derived in Norfolk from this indispensable portion of the process. The third difficulty was to induce them to replace broadcast sowing by drilling, which appeared, as we see, to novices no less ridiculous than peppering the land from a cruet. The bigotry of the farmer cramped the energies of the mechanics whom he now welcomes as among his best friends. The implements, even by

the first manufacturers, from the absence of critisism and competition, from the limited extent of custom, and from the want of artisans skilled in working in iron, were, however excellent in idea, but clumsy and costly. The choicest specimens which existed in 1840 have been so altered in execution by cheaper materials and improved workmanship that they can scarcely be recognized."

With the aid of root crops and that of machinery in our labour, it is not difficult to anticipate the time when our farmers shall labour less, but yet prosper more. The success of the steam plough on the beautiful and fertile prairies of the West, almost makes real the expression in the fine lines of Mr. Thackeray on the Great Exhibition in England in 1851.

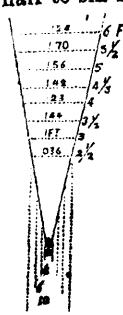
Look yonder where the engines tow,
The Nation's arms of conquest are,
The trophies of her bloodless war ;
Brave weapons these.
Victorious over wave and soil,
With these she sails, she weaves, she *tills*,
Pierces the everlasting hills
And spans the seas.

New-England Farmer.

UNDERDRAINING.

In executing a system of thorough drainage, as in all other work, it is necessary to make the original cost as slight as possible, in order to realize the greatest return in proportion to the outlay. That this may be done, it is necessary for the person having charge of the work to be familiar with all its details, both scientific and practical, and to know the most effective use of labor, that he may attain the desired object by the shortest and simplest process. Very much work, however, must be done where the services of such a person cannot be readily obtained ; it then becomes necessary for the proprietor to do his work as economily as possible, with such knowledge as can be obtained from those more familiar with the work. To such, I propose to make a few suggestions on a single practical point, which may be useful to them.

The only object for which trenches are cut in underdraining is that the pipe may be placed in its proper position, and as the amount of earth thrown out materially affects the cost of the work, it is of great importance that no more earth should be distnrbed than is necessary to give the workmen room for a free use of their tools. The width at which trenches can be most economically cut is much less than is generally supposed, and the dimensions that are given below, though they may seem small, are the result of some experience and may be relied on, except in peculiar circumstances. The accompanying diagram shows the lines that may be followed in forming the cross section of a trench from two and one-half to six feet deep, and to admit a pipe from one to eight inches inside bore.



The full lines represent the side of the trench, the horizontal dotted lines are at certain distances from the bottom, as represented by the figures opposite each at the side. The figures above each represent the width of opening at the surface for a trench of that depth, the widths are given in feet and hundredths, to reduce the decimal to inches, divide by eight, the result will be inches nearly. The vertical dotted lines show what earth must be removed in order to increase the width at bottom to receive the larger sizes. Suppose a trench is to be dug four and one-half feet deep, the number opposite 4½ is 1.42 or one foot five inches, which is the width of opening at surface.

If the trench is to be three feet deep it need be opened only one foot wide at the top, and with proper tools, it can be carried down to a width of about two inches at the bottom, though, of course, the foot of a man cannot come within six or eight inches of the bottom, in which case the pipes are laid by a man walking on the surface at the edge of the trench, who lifts the pipe, piece by piece, with a kind of hook made for the purpose, and lays them carefully in the trench.

If the work is done by a common spade, the width of opening at the top may be the same and the sides can be carried down as near together as the width of spade will allow. The "Irish spade" has been used by Judge French in opening trenches on his grounds in Exeter, during the past season, and with very satisfactory results. This tool being owned by many persons in this vicinity, who may undertake such work, I suggest that it will be well to use it in preference to the common spade.

As it is not necessary to the convenience of the workmen that the sides of the trench be carried down any nearer vertical than is represented in the engraving, they may be opened and carried down in the same manner, for each size of the pipe, until the sides have approached so near, that a pipe of the size required can be just passed between them; the cut may then be carried down vertically to the depth required. This allows much earth to remain which would be thrown out if the sides were cut straight down from the width opened at the top to the width at bottom. A skillful workmen will dig the trenches with ease in this way, after some practice, though it may be a little troublesome at first. I am now having trenches dug in which the opening at the surface is even less in width, for the required depth, than is here given.

The labor of one man in a day of ten hours varies very much under different circumstances.

1. In hard, gravelly and clay soils, where picking is constantly necessary, a man will throw out only from three to five cubic yards in a day.

2. In ordinary clay and gravel, with one occasional use of the pick, he will throw out about ten cubic yards a day.

3. In loose earth, without picking, or in shovelling after the picking of another, as in railroad excavations, a man throws out fifteen to eighteen cubic yards a day.

In the first case, a yard, or twenty-seven cubic feet, will be removed for twenty-five cents, by a man who works a day, of ten hours, for one dollar.

In the second case the removal of a yard will cost ten cents. This will be the basis of our estimate of the cost of cutting trenches, from the fact that most soils which need draining may be classed under this head.

In the third case, one yard will be removed for about six and one-fourth cents.

The solid contents of earth removed from a trench one hundred feet long, of sufficient width at bottom to admit the smallest sized pipe, and of the depth as shown, is as follows—

Depth.	*Cubic Feet.*	*Cubic Yards.*	*Cost.*
2½ feet	127.5	4.72	$0,47.
3 "	174.	6.46	0,65.
3½ "	227.5	8.43	0,84.
4 "	288.	10.67	1,07.
4½ "	355.5	13.17	1,32.
5 "	430.	15.93	1,59.
5½ "	511.5	18.94	1,90.
6 "	600.	22.22	2,22.

To this must be added the cost of tools, trimming, and superintendence.

The quantity removed by encreasing the width at the bottom of the trench so that it may admit pipes of the larger sizes is very slight being only one and one-

fifth cubic feet in one hundred feet length, on increaing the width to three inches at the bottom. Quantity removed by increasing the width to four inches is four and four-fifths cubic feet ; to five inches, ten and four-fifths ; to six inches, twenty and two-fifths feet ; to eight inches, forty-five feet ; and to ten inches seventy-nine and one fifth feet.

The increased cost being for the three inch width one-half cent; for four inch, two cents , for five inch, four cents : for six inch, eight cents; for eight inch, seventeen cents ; and for ten inch, twenty-nine cents.

The amount of earth removed by widening the trench for a larger pipe is the same in every case, without regard to the depth. Take an example ; a trench is to be dug four feet deep for a one inch pipe, the cost of which will be $1,07, for one hundred feet, and a trench of the same depth for an eight inch pipe will cost $1,36. If the trench is to be six feet deep for a small pipe, the cost will be $2,22, and for the large pipe $2,51 ; the increased cost in each case being 29 cents. A pipe with an eight inch bore requires a trench ten inches wide at bottom.

Judge French, of Exeter, whose work is done in a systematic and very skillfull manner, had a trench two hundred and thirty feet long, four feet deep, with a width at top of twenty inches and at the bottom of four inches, cut in one day, by two men, at a cost of two dollars ; by the basis used in our estimates, it would cost three dollars and forty-one cents, but the digging was quite easy on his land, the soil coming under the third case cited above, and would by that basis cost two dollers and thirteen cents, the estimate being thirteen cents more than the actual cost on the entire length, or less than one cent a rod.

These estimates call for no more work than any man with ordinary skill in handling the spade should do, though few trenches, probably, are so economically cut, except under the direction of a competent superintendent, who is familiar with the work.

J. Herbert Shedd.

New England Farmer, Boston, Nov., 1858.

Poultry Yard.

THE GREAT FRENCH HENNERY.

With care and good management, no branch of domestic industry is more profitable than rearing poultry. Many persons have supposed that what is profitable on a small scale might be made still more so when carried on to a larger extent, but repeated experiments in this and other countries have proved this to be a mistake. The secret of the matter is, that hens cannot thrive and lay, without a considerable quantity of animal food. Where but a limited number of fowls are kept about the farm-yard, the natural supply of insects is sufficient to meet this demand, and hence, when attempts have been made to extend the business beyond this source of supply, they have not prospered. It will be seen from the following account that Mons. de Sora, of France, has adopted a method that has proved completely successful by affording an artificial supply of this essential portion of food.

The French practical philosophers certainly knew how to make the most of things. A Mons. de Sora has recently discovered the secret of making hens lay every day in the year, by feeding them on horse flesh. The fact that hens do not lay eggs in winter as well as in summer, is well known, and the simple rea-

son appears to be that they do not get the supply of meat in winter which they obtain in the warm season from worms and insects.

M. de Sora was aware of all these facts, and living at the time upon an old dilapidated estate, a few miles from Paris, the acres having been bequeathed to him a few years previously—he set himself earnestly at the task of constructing a hennery, which should be productive twelve months in the year. He soon ascertained that a certain quantity of raw mince meat given regularly with the other feed, produced the desired result, and commencing only with some 300 female sowls, he found that they averaged, the first year, some twenty-five dozen eggs, each, in the 365 days. The past season he has wintered thus far, about 100,000 hens, and a fair proportion of male birds, with a close approximation to the same results. During the spring, summer and autumn, they have the range of the estate, but always under surveillance. In the winter, their appartments are kept at an agreable temperature; and, although they have mince meat rations the year round, yet the quantity is much increased during cold weather. They have free access to pure water, gravel and sand, and their combs are always red. To supply this great consumption of meat, M. de Sora has availed himself of the constant supply of superannuated and damaged horses, which can always be gathered from the stables of Paris and the suburbs. These useless animals are taken to an *abattoir* owned by M. de Sora himself, and there neatly and scientifically slaughtered. The blood is saved, clean and unmixed with offal. It is sold for purposes of the arts at a remunerative price. The skin goes to the tanner—the head, hoofs shanks, &c., to the glue maker and Prussia blue manufacturer; the larger bones form a cheap substitute for ivory with the button maker, while the remainder of the osseous structure is manufactured into ivory black, or used in the shape of bone dust for agricultural purposes. Even the marrow is preserved; and much of the fashionable and highly perfumed lip salve and pomade, was once inclosed within the leg bones of old horses. Uses are also found for the entrails—and in fact no portion of the breast is wasted.

The flesh is carefully dissected off the frame of course, and being cut into suitable proportions, it is run through a series of revolving knives, the apparatus being similar to a sausage machine on an immense scale, and is delivered in the shape of a homogeneous mass of mince meat, slightly seasoned, into casks, which are instantly headed up, and conveyed per railroad, to the egg plantation of M. de Sora.

The consumption of horses for this purpose, by M. de Sora, has been at the average rate of twenty-two per day for the last twelve months, and so perfectly economical and extensive are all his arrangements, that he is enabled to make a profit on the cost of the animals by the sale of the extraneous substances enumerated above—thus furnishing to himself the mince meat for less than nothing delivered at his hennery.

It has been ascertained that a slight addition of salt and ground black pepper to the mass, is beneficial to the fowls, yet M. de Sora does not depend upon these condiments alone to prevent fermentation and putrefaction, but has his store rooms so contrived as to be kept at a temperature just removed from the freezing point through all months of the year, so that the mince meat never becomes sour or offensive; the fowls eat it with avidity; they are ever in good condition, and they lay an egg almost daily, in all weathers, and in all seasons.

The sheds, offices, and other buildings, are built around a quadrangle, enclosing about twenty acres, the general feeding ground. This latter is subdivided by fences of open paling, so that only a limited number of fowls are allowed to herd together, and these are arranged in the different compartments according to age, no bird being allowed to exceed the duration of four years of life. At the end of the fourth year, they are placed in the fattening coops for about three weeks, fed entirely on crushed grain, and sent alive to Paris.

As one item alone in this immense business it may be mentioned that in the months of September, October and November last, M. de Sora sent nearly one thousand dozen of capons to the metropolis.

He never allows a hen to set!

The breeding rooms are warmed by steam, and the heat is kept up with remarkable uniformity to that evolved by the female fowl during the process of incubation, which is known to mark higher on the thermometer than at any other periods. A series of shelves, one above the other, form the nests, when blankets are spread over the eggs to exclude any accidental light. The hatched chicks are removed to the nursery each morning, and fresh eggs laid in to supply the place of empty sh ells. A constant succession of chickens are thus insured, and moreover the feathers are alway ree from vermin. Indeed a lousy fowl is unknown upon the premises.

M. de Sora permits the males and females to mingle freely at all seasons, and after a fair trial of all the various breeds, has cleared his establishment of every shanghai, cochin china, or other outlandish fowl, breeding only from old-fashioned barn-yard chanticleers, and the females of the same species. He contends that the extra size of body and eggs pertaining to these foreign breeds can only be produced and sustained by extra food, while for capon raising the flesh is neither so delicate nor juicy as that of the native bird.

The manure produced in this French establishment is no small item, and since it forms the very best fertilizer for many descriptions of plants it is eagerly sought for at high prices by the market gardeners in the vicinity. The proprietor estimates the yield this year at about 100 cords. He employs nearly 100 persons in different departments, three-fourths of whom, however, are females. The sales of eggs during the past winter have averaged about 40,000 dozens per week, at the rate of six dozens for four francs, bringing the actual sales up to $5,000 in round numbers, for every seven days, or $260,000 per annum. The expenses of M. de Sora's hennery, including wages, interest, and a fair margin for repairs &c., are in the neighberhood of $75,000, leaving a balance in his favor of $185,000 per year, almost as remunerative as Col. Fremont's Mariposa grant.—*From the New England Farmer.*

THE POULTRY TRADE.

It is because no other article of country produce interestes so many persons that we devote so much attention to the trade in poultry. The business of rearing poultry for market, is mainly in the hands of women and children—it is a household manufacture. Hens are often nested in the little nooks and corners at the very kitchen door, and the chickens cooped at the door-step edge, and not unfrequently pick the crumbs that fall from the kitchen table;—and when finally grown to marketable fitness they are killed and dressed in the same kitchen, and the proceeds of sale are devoted especially to the use of "the women folks."

Poultry fit for market, is that which has been grain-fed to fatness, and has been killed by being hung by the heels and bled to death from a penknife incision in the neck then scalded moderately, and left in a pile under a blanket or something a few minutes, to steam and loosen the feathers, and then, after being so carefully picked as not to break the skin, dipped suddenly in water hot enough to give the skin an oily, rich appearence. Then the birds must be laid out handsomely upon clean boards, in a cold room, till entirely cool (not frozen), then carefully packed in layears, with clean rye straw, in boxes, and nailed so tight that all the tumbling shall not displace a bird, or chafe an inch of skin. Such poultry sold rapidly on Saturday at: Turkeys, per. lb., 12½ a 13c.; Geese,

10 a 11c.; Ducke. 13 a 14.; Fowls 10 a 11c.; Grouse, per. pair, 62 a 69c.; Quails, per. doz., $1 50.

The wild birds are never picked, and the grouse that sold highest were birds trapped in Iowa, and carefully killed and handled, and each one wrapped in paper—none the worse that the paper was of old numbers of *The Tribune*—and very snugly packed, with here and there a quail stuck in to fill up, and sent hither by the Americain Express fast lines.

Sending poultry by express lines is all important, as witness this: A man in Indiana put up a lot of turkeys, just as we have often directed, and sent the package by ordinairy freight line. It started on Novembre 25, and was sixteen days—days of damp and not cold weather—on the way. It was sold to a "Washington marcket poultry doctor," who understands the art of deodorization, at seven cents a pound. Put up in the same way, and sent by express, it would have sold the same day at 13 or 14 cents a pound.

Ladies Department.

THE SEEDS OF CONSUMPTION The terrible mortality caused by bronchitis, pneumonia, and consumption, which together kill—in England and Wales only—a hundred thousand people every year (being one fourth of the entire mortality from more than a hundred other causses in addition to themselves,) should make us think a little seriously of many things, and not less seriously of the freaks of fashion which set climate at defiance. Why do we send children abroad in damp and cold weather with their legs bare, submitted, tender as their are, to risks that even strong adults could not brave with impunity.

Custom has made this appear familiar and trifling but it is not out of place to say, at the beginning of another winter, that the denial to young children of proper skirts to their clothes, and warm coverings to their legs, has sown the seeds of consumption in thousands, and is, of many dangerous things done in obedience te law of fashion, the one that is most thoughtless and cruel.

It is in the child that consumption can most readily be planted—in the child, that when the tendency exists, it can be conquered, if at all. It is to be fought against by protecting the body with sufficient clothing against chill and damp, bp securing it plenty of wholesome sleey—not suffocative sleep among feathers and curtains—plenty of free ablutien without prejudices on behalf of water icy cold—olenty of cheerfur exercise short of meat and bread, wholesome pudding. Those, indeed, are the things wanted by all children.

Many a child pines in health upon a diet stinted with the best intentions. But the truth is, that it is not possible to over feed a child with wholesome eatobles. It can be stimulated to excess in the demolishing of sickly dainties; and, with a stomach once fairly depraved, may be made incompetent to say when it his had too little or too much. But a child fed only upon wholesome things knows berrer than any mamma can tell when it wants more; it can eat a great deal; has not only to maintain life, but to add height and breadth to statue.

Fortify it, then, against variations of climate, by meeting freely the demands of its body; give it full animal vigor to resist unwholesome impressions. Especially let the good housewife, who has a good family to feed, learn to be utteerly reckless as to the extent of her milk-score. Somebody has daclared a pint of milk to contain as much nourishment, as half a pound of meat. Be this as it may, it is the right food for little ones to thrive upon, and may save muok subsequent expenditure for cod-liver oil.—*Household Words.*

MONTREAL RETAIL MARKETS.

FRIDAY, January 29th 1858.

	BONSECOURS.				ST. ANN'S.			
FLOUR.	s.	d.		s. d.	s.	d.		s. d.
Country Flour, per quintal	15	0	a	16 6	0	0	a	0 0
Oatmeal, per quintal	13	6	a	13 9	0	0	a	0 0
Indian Meal, per quintal	0	0	a	0 0	0	0	a	0 0
GRAIN.								
Wheat, per minot	0	0	a	0 0	0	0	a	0 0
Oats, per minot	2	9	a	3 0	2	3	a	2 6
Barley, per minot	3	6	a	3 9	0	0	a	0 0
Pease, per minot	3	9	a	4 0	0	0	a	0 0
Buckwheat, per minot	2	6	a	2 9	0	0	a	0 0
Indian Corn, yellow	4	0	a	4 6	0	0	a	0 0
Rye, per minot	0	0	a	0 0	0	0	a	0 0
Flax Seed, per minot	7	0	a	7 3	0	0	a	0 0
Timothy, per minot	9	0	a	9 6	0	0	a	0 0
FOWLS AND GAME.								
Turkeys, (old) per couple	6	0	a	10 0	10	0	a	12 0
Turkeys, (young) per couple	0	0	a	0 0	6	0	a	8 0
Geese, (young) per couple	5	0	a	10 0	3	6	a	4 6
Ducks, per couple	3	0	a	3 9	2	6	a	3 0
Ducks, (wild) per couple	0	0	a	0 0	0	0	a	2 6
Fowls, per couple	2	6	a	3 0	2	0	a	3 0
Chickens, per couple	0	0	a	0 0	1	3	a	1 6
Pigeons, (tame) per couple	1	3	a	1 6	0	0	a	0 0
Pigeons, (wild) per dozen	2	6	a	3 0	3	6	a	4 0
Partridges, per couple	0	0	a	0 0	0	0	a	0 0
Woodcock, per brace	0	0	a	0 0	0	0	a	0 0
Hares, per couple	0	0	a	0 0	0	0	a	0 0
MEATS.								
Beef, per lb	0	4	a	0 9	0	4	a	0 8
Pork, per lb	0	5½	a	0 6	0	6	a	0 6½
Mutton, per quarter	6	0	a	12 0	7	0	a	12 0
Lamb, per quarter	2	6	a	4 0	2	0	a	3 9
Veal, per quarter	5	0	a	15 0	5	0	a	15 0
Beef, per 100 lbs	30	0	a	45 0	30	0	a	40 0
Pork, (fresh) per 100 lbs	30	0	a	35 0	27	6	a	30 0
DAIRY PRODUCE.								
Butter, (fresh) per lb	1	3	a	1 6	0	11	a	1 0
Butter, (salt) per lb	0	10½	a	0 11	0	8	a	0 9
Cheese, per lb, skim milk	0	0	a	0 0	0	0	a	0 0
Cheese, per lb, sweet do	0	0	a	0 0	0	0	a	0 0
VEGETABLES.								
Beans, (American,) per minot	0	0	a	0 0	0	0	a	0 0
Beans, (Canadian) per minot	7	6	a	8 0	0	0	a	0 0
Potatoes, (new) per bag	3	0	a	3 9	4	0	a	5 0
Turnips, per bag	0	0	a	0 0	0	0	a	0 0
Onions, per bushel	0	0	a	0 0	0	0	a	0 0
SUGAR AND HONEY.								
Sugar, Maple, per lb, (new)	0	5½	a	0 6	0	4	a	0 4½
Honey, per lb	0	0	a	0 0	0	7½	a	0 8
MISCELLANEOUS.								
Lard, per lb	0	8	a	0 9	0	8	a	0 9
Eggs, per dozen	1	6	a	1 9	0	8	a	0 9
Halibut, per lb	0	0	a	0 7½	0	0	a	0 0
Haddock, per lb	0	0	a	0 2½	0	0	a	0 0
Apples, per barrel	25	0	a	35 0	15	0	a	20 0
Oranges, per box	0	0	a	0 0	0	0	a	0 0
Hides, per 100 lbs	0	0	a	0 0	0	0	a	0 0
Tallow, per lb	0	4½	a	0 5	0	0	a	0 0
BREAD.								
Brown Loaf	0	11	a	0 0	0	9	a	1 0
White Loaf	0	0	a	0 0	0	9	a	0 0