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NEWCASTLE FARMER.

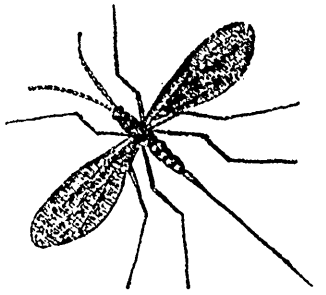
VOL. II.—NO. XII. COBOURG, AUGUST 1, 1848. THOS. PAGE,—Editor.

BLIGHTS OF THE WHEAT.

CHAPTER VII.

Remarkable as are the diseases prevalent in the wheat, which have been treated on in the last two chapters, they are scarcely more interesting objects of inquiry than the curious devastator of the growing crops to which attention is now about to be directed. Every farmer knows the loss that he constantly sustains, from the large mixture in his samples of shrivelled and defective grains. This continually happens, even when the blossoming plants have promised to yield the most healthy produce, and all his prospects have been as bright as possible. Harvest, however, and the threshing season, have disappointed him, and the reason of the defect in the corn has been completely wrapt in mystery. The researches of entomologist here come to aid him in the discovery of his hidden unsuspected enemies, and demonstrate to him that the defect is frequently due to an insect which, though myriads of them may have existed in his fields, he has never seen or heard of. It is a true parasitic fly of singularly beautiful formation, and its scientific name is *cecidomyia tritici*, or wheat midge. The time to see these midges is in the month of June, from seven till about nine o'clock in the evening, when they often swarm amongst the then blossoming ears of corn. They may be discovered busily engaged about the flowers, and their occupation is laying their eggs in them. Here the eggs produce little yellow maggots, or larvæ, which injure the young ovary, and consequently prevent the grain from attaining its due growth and swelling to its natural dimensions. These maggots are easily found in the ears when the grain is formed, by pulling back the chaff scales. The author for several years past has certainly found large numbers of them, and they have been often brought for his inspection, by farmers who have searched for them at his suggestion. They are mostly accompanied by an orange-coloured dust, which is merely the red robin, with which the reader has been made acquainted in a previous chapter. One farmer imagined that these larvæ were of great use in feeding on this fungus. This was a natural mistake for an unscientific person; but it tends nevertheless to prove to more experienced investigators how cautious they should be not to connect things with each other, simply because they are coincident. The wheat midge lays its eggs in the wheat, breeds in the ear, and does the mischief before noticed. It is therefore, according to the definition given in the first chapter, a real parasite. Though incalculable damage results from its ravages, a description of it will most likely be a novelty to many readers who may have suffered greatly from it, and who are not acquainted with what has been written on the subject.

By far the best account of this curious fly is that of Mr. Curtis, in his admirable papers published in the Journal of the Agricultural Society. It appeared in the second part of the sixth volume. The drawing here given is according to his description, and represents a female with its ovipositor, of which much will be said hereafter. The fly itself is of a pale ochreous hue, and hairy. Its eyes are extremely black, and coarsely granulated, meeting on the crown, and nearly covering the whole head. It has no *ocelli*. There is no visible indication of a mouth, except a short lip and two feelers. The antennæ are as long as the body; the thorax is of a reddish ochre in colour, and the wings are longer than the body, of a whitish yellow, pubescent, and beautifully iridescent when seen in repose. The abdomen is short, tapering to a point,



Natural length of the Midge and ovipositor.

Magnified figure of Wheat Midge.

and is furnished with an ovipositor, or instrument for laying its eggs, nearly three times as long as the body, the oviduct being extremely slender. Mr. Curtis states that he has never seen the male fly, but has no doubt that he should find in it a different form of antennæ. There is abundant matter, in the whole of the papers of Mr. Curtis on the insects affecting the corn crops, to induce a careful perusal. They bring before us, in a most interesting form, many wonderful facts relating to the economy of these minute portions of the creation.

The venerable naturalist, Mr. Kirby, has long been more intimately acquainted than most others with the habits of the wheat midge. In the summer of 1798, he had a good opportunity of making observations upon it, and in the early part of the year following he communicated them to the Linnean Society in his usual felicitous manner. He saw swarms of them about eight o'clock in the evening, at which time they were busy laying their eggs; but towards nine they had nearly all left the scene of their operations. So numerous were they, that he noticed a dozen at a time laying their eggs upon the same ear. At the same time, he could not discover one he could pronounce to be a male. The males most likely make their appearance at some other time.

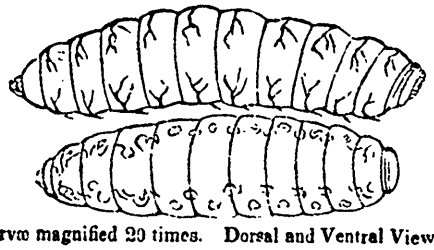
Though seen in such multitudes at night, the morning does not exhibit a single one in action; but they are to be found while reposing on the wheat-stalks. If the growing corn is well shaken, they fly languidly about, a short height from the ground, disturbed but not invigorated. They take their rest low down upon the plant, with their heads pointed towards the sky, in which position they may be readily found. The great business of this singular creature seems to be the safe deposition of its eggs in the florets of the wheat. When occupied in this way, they are not easily moved from their engagement, but may be examined if pains are taken to effect this object.—They invariably assume the position most favourable for the insertion of their eggs, by the long ovipositor with which nature has provided them. No indication is afforded by the common appearance of the flies that they are possessed of so curious an instrument, but on pressing the anus of any one of them it may be discovered; and they have the power of unsheathing it at pleasure. They are armed with what Mr. Kirby called a long retractile tube, or *vagina*, which unsheaths an *aculeus*, or pointed instrument like a sting, as fine as a hair. This is introduced into the floret, and by it the eggs are deposited upon the interior valuvle of the corolla just above the *stigmata*. The accurate entomologist, to whom we owe these observations, has discovered them several times caught prisoners by being unable to withdraw this instrument. He also witnessed the operation of depositing the eggs, after many attemps in which he failed. One day he gathered an ear upon which the flies were actively engaged, and was en-

abled by the aid of a pocket microscope to view this remarkable process. "I could," he says, "very distinctly perceive the eggs passing one after another, like minute air-bubbles, through the vagina, the aculeus being wholly inserted into the floret." He adds, "I examined this process for full ten minutes before the patient little animal disengaged itself, and at last it was through my violence that she discontinued her employment, and flew away." If all the eggs that are thus layed in favourable seasons were to be hatched, or if Providence had provided no antidote to their multiplication, the mischief done to our wheat crops would be of the most alarming kind.

The eggs are oblong, transparent, and yellowish, and give birth to larvæ; some of which have at first little or no colour, while others are straw-coloured, yellow, or orange, according to their age. The author found them in abundance during

Views of Larvæ of Wheat-midge, magnified 10 diameters.

August, 1845. The natural size of the larvæ is acurately given in the drawing, and also their appearance when magnified ten diameters. Magnified still farther to the extent of



Larvæ magnified 20 times. Dorsal and Ventral Views.

twenty times, the dorsal and ventral appearances were as here drawn by Mr. Leonard, to whom specimens were entrusted for that purpose. These larvæ have been thought by some persons to feed on the pollen, while others think they live on the juices of the ovary. They unquestionably destroy in some way the power of fructuation; for, after their operations have commenced, it is certain that the germen never swells, and complete sterility results. These little maggots, as has been mentioned, are very easily found upon searching in an ear of wheat that has been frequented by the midges. When the corn is threshed they may be discovered in the chaff dust, and look as if they had entered into the chrysalis state. At first sight, those figured here gave this appearance, but they proved to be larvæ covered with a singular kind of membrane.—Whoever takes the fine dust on the barn floor in his hand, may easily pick them out, and will perceive them to be exactly of the size given in the figures. A good preparer of objects for the microscope would put some up in Canada balsam, when they might be easily examined. Naturalists who have given their attention to these insects, are of opinion that the chrysalis state is not reached till the spring, and that the thin membranous covering is a protection against cold till that condition is attained. It is true that there has been one instance of a fly hatched from a chrysalis in September, but this was an exception. There have been many attempts made to breed these flies from the larvæ covered with the membrane, or the supposed chrysalides found in the chaff; but all have failed. It was tried in vain by the writer; but he thought others might have obtained them by reason of more skilful methods, till on inquiry he found they were equally unsuccessful. Conjectures have, as usual, been sufficiently abundant; and a question has been raised, whether the larvæ do not enter the earth to become pupæ, or chrysalides. Certain it is that the membranous cases of the larvæ are found left adhering to the sound grains and to the chaff-scales; and professor Henslow and others assert, that some larvæ have been known to leave the ears and bury themselves in the earth. Any entomologist who decides the question whether these larvæ certainly enter the ground to turn into pupæ, will do great service to science in general, besides affording information to the farmer respecting the habits of one of the most fatal enemies to his produce when the season is suitable to them. In the author's opinion, the loss in 1845, over some farms, in the county of Norfolk, was considerable; and Mr. Kirby, several years ago, calculated the destruction in one particular field of wheat which he examined, as at least twenty bushels in fifteen acres. In Perthshire, the loss inflicted by the midge in 1828 was estimated, by a careful calculator, at one-third of the crop. In 1830, an intelligent agriculturist in the north observed, "Another year or two of the wheat-fly will make two-thirds of the farmers here bankrupts." Happily these are not common cases; but they are such as the agricultural districts are perpetually in danger of, and therefore the farmers ought to be made well aware of the possibility of the encroachments they are liable to when the flies multiply to any great extent. It does not follow, that because in certain years the damage they have done is insignificant, it will be so at other times, when the flies may, perhaps, come in overwhelming numbers, unless a knowledge of their habits enables us always to oppose a proper check to their increase. "I fear," says Mr. Curtis, "the ingenuity of man will never devise any method for the destruction of this little 'rogue in grain' when once he has taken possession of a standing crop." Professor Henslow likewise remarks, "The researches which I have made on the subject since my report was written, have satisfied me that the damage done by this minute insect is much greater than agriculturists are at all aware of." The author can assert, that in the autumn of 1845, he found great quantities of the larvæ not only in a first-rate wheat district in Norfolk, but in other parts of the country. Ear after ear was gathered by him, examined, and the contents shown to farmers who never before had even heard of such things, and who were perfectly astonished when they saw them. Often has he also entered a barn and taken up a handful of dust from the floor where wheat has been winnowed, turned out the little orange-coloured devourers, now in their membranous cases, one after another, but scarcely ever met with any person who had previously noticed them. If they had seen them, they took them for the seeds of some kind of weed. There seems also to be good reason to suppose that the wheat midge is to be found on the continent of Europe, and that it attacks the corn crops in France, causing the same sterility in the grains that has been shown to be the result of its ravages in England. Such facts are of inestimable advantage; for not only do they enlarge our perception of the wonders of creation, but give us an insight into methods by which skilful observers, resident in the country, may confer signal advantages on their neighbours. To dwell upon the history of the habits of a little midge may appear at first sight trifling and unworthy of an enlarged, well informed mind; but when the benefits on the one hand, and the injuries on the other, of which a multitude of little things are the cause, are considered, we shall soon perceive that the investigation of every single thing made, is a pursuit worthy of not only a rational but of a pious and benevolent spirit, desirous both to give honour to God and to confer benefits on man.

The midge just described in this popular notice, has been properly called the British wheat-midge. There is another midge, of different habits, called the American wheat-midge. It has been designated by entomologists *cecidomyia destructor*, a name which its destructive ravages entirely warrants. The accounts of the dreadful havoc it had made in the crops in America caused much alarm in this country. Happily for us, this apprehension was groundless. The American wheat-midge usually passes under the name of the Hessian fly, because when it was first noticed, the idea prevailed that the Hessian troops brought it with them in their straw from Germany. The year 1776 was the period of its being observed as committing serious devastations. Indeed, such were the injuries it inflicted on the wheat-crops in America, that a question was raised, whether the culture of this grain could be any longer carried on in security. It seems, however, that the work of destruction does not now prevail to a very great degree. Autumn is the season when these attacks commence:

no sooner do the plants appear above ground than they are devoured. Frost causes the flies to desist; but in the genial days of spring they come forth again. They lay their eggs in the interior of the stem, which is so weakened that it cannot support the ear when the grain begins to swell, and consequently the plant falls and perishes. "All the crops," says Mr. Kirby, "as far as it extended its flight, fell before this ravager. It first showed itself in Long Island, from whence it proceeded inland, at about the rate of fifteen or twenty miles annually, and by the year 1789, had reached two hundred miles from its original station. I must observe, however, that some accounts state its progress at first to have been very slow, at the rate of about seven miles per annum, and the damage inconsiderable; and that the wheat-crops were not materially injured by it before the year 1788. Though these insect hordes traverse such a tract of country in the course of the year, their flights are not more than five or six feet at a time. Nothing intercepts them in their destructive career, neither mountains nor the broadest rivers. They were seen to cross the Delaware like a cloud. The numbers of this fly were so great, that in wheat harvest the houses swarmed with them, to the extreme annoyance of the inhabitants. They filled every plate or vessel that was in use; and five hundred were counted in a single glass tumbler exposed to them a few minutes, with a little beer in it." This is Mr. Kirby's account; and an interesting description of the fly itself is given by Mr. Curtis, in the papers previously adverted to. We have only to hope this mischievous insect will never appear in England, and have great reason to be thankful that hitherto it is unknown in our island. In the next chapter, a description will be given of the antidotes to the mischiefs of the midges, both natural and artificial.

AGRICULTURE OF NORMANDY.

SHEEP.—The kinds of sheep maintained on the uninclosed farms of Normandy are large and short-wooled, a cross for the most part, but in ever varying proportions, between the German, Dutch, and Merinoes; they have long, white faces, generally without horns, with a tuft of coarse, hairy wool on the top of the head; long, heavy-boned legs, but broad backs and round bodies; their tails are allowed to grow, and they have almost as much *action* as a Shetland pony. Breeding is not attended to, nor are any lambs reared in this district; indeed the flocks are principally composed of wether sheep, purchased at the large fairs in the interior. Their tempers are most docile, and one old man, with his gem of a shepherd's dog, has no difficulty in managing a flock of two or three hundred, although there is neither bank nor rail within a dozen miles of them. On a piece of clover, or summer fallow, a moveable fold is pitched, where the sheep are keep at night, and an hour or two during the heat of the day. The shepherd has a little covered cart, upon two wheels, placed outside the fold, in which he sleeps, and, in fact, lives the whole summer season, when not on his legs with the sheep. His dog, as intelligent but more vigilent and active than himself, has another little house, also placed on wheels, close by. The fold is changed every night, and amply repays, by the rich legacy it bequeaths to the land, all the trouble attending it. In winter the sheep are closely housed in the "bergeries," or other stables, which are always erected in the orchard, upon all large farms. The sheep are neither tied nor staked, but classed in separate houses, according as they are "just put up" to faten, or are "finishing" for the butcher.

The floor of the building, which is paved, or hard-rammed, is thickly littered with fresh straw, and down the centre of the house ranged troughs, in which water, with oil-cake dissolved in it, and thickened with crushed oats, barley meal, or Indian meal. Around the wall are low cratches or racks, in which oat straw and sometimes hay are placed for the sheep to pick over.

These houses are almost without ventilation, and the heat of the internal atmosphere, when entered on a winter's morning, is enormous. We must leave it to others to determine how far this excessive warmth *is desirable*; but it is said that the wool is of far greater value, after this winter treatment, than if the flocks were *left exposed to the wet and* cold of the pastures; and we have certainly never seen any indication of ill-health among sheep housed *upon this system*. It should also be remarked that the shepherd invariably sleeps in the "bergeries," in a kind of bed or hammock, suspended from the ceiling, which is, of course, placed in the warmest statum of air, and the health of the man is said to be no way affected by this custom.

Immense quantities of the richest manure are made by this plan of house feeding sheep, and we have the rather dwelt upon it because we believe it to be a system which may be acted upon (as, doubtless, it partially is) in Ireland, and with the happiest results. Indeed, very small farmers, who cannot readily command the means of purchasing lean horned stock, might house-feed a few lean wethers, upon this plan, (which is, however, susceptible of much obvious improvement,) with great advantage and profit. Women and young chilren generally attend them, and fat spring sheep are good ready money to any man. But the Norman sheep-dog, who shall tell all his excellencies, or appreciate his almost supercanine intelligence. The best pictorial representation of it to which readers can be referred is the old Irish *wolf-dog*, of which a description and illustration was given by that intelligent and interesting naturalist, Mr. Richardson, *in the Gazette*, of last year.

The Norman sheep-dogs are black, slightly shaggy, and larger than our "colleys," with ears erect, tail long and curved upwards when excited, but pendent when at rest, an eye keen and vigilent as that of an eagle, limbs strong and in every restless motion except when the animal is chained to his "chenil" or moveable kennel. The countenance is elongated and placid, and very similar to that of our own dogs. The race appears evidently descended from the wolf, and is known by the distinctive name of "chien-loup" or wolf-dog. They are brought from the south of France, and as they approach the Pyrennees increase in size and in resemblance to the wolf. They are but poorly fed, and being always in motion have a lean and "tucked up" kind of look. At night they will hear the most distant foot-fall, and will instantly alarm the shepherd.

The sheep appear to regard them as their best protector, and never seem scared or alarmed. Unlike most other kinds, this dog is very impatient of castigation, and, probably, would not submit to it, if inflicted by a strange hand. Indeed, a good shepherd seldom strikes his dog, for by voice or sign he can easily obtain all the service he requires. He sulky towards strangers, and is above a bribe. His *is duties are not* very various, but require almost perpetual motion. In collecting the sheep, or keeping them together, the dog is seldom wanted; for the domestic treatment and docile tempers of the flock induce them always to keep close to the shepherd, whom they *follow*, but never precede. When he takes any which may be ready for slaughter to the butcher, they will follow him from the farm to the slaughter-house, along a road which they have never travelled, and through the streets and alleys of the towns, with the sagacity of a terrier. Indeed, such is the affection existing between a shepherd and his flock, that, to a good Norman shepherd, his most ungrateful task is to conduct his pets to the slaughter.

The manner in which a large flock of wedders is managed, presents a string contrast to the brutality and ignorance of some of our own drovers, who, in the vicinity of the British metropolis, at least, are amongst the most ferocious of uncivilized humanity. The dog is seldom required either to catch or hold a sheep, for the shepherd had no difficulty selecting and quietly examning any one of the number which requires his attention, and without placing any restraint on the patient and intelligent brute.

We may add, that we have never seen, a "crosier" in use. The principal duty of the dog, then is to guard *the crops* among which the flock feeds, but upon which they are not allowed to trespass. At break of day, a shepherd will lead forth

his flock from the *bergerie*, or sheep-fold, ("they hear his voice, for he calleth them all by their names, and he leadeth them out; and when he has brought out his sheep, he goeth before them, and the sheep follow him, for they know his voice,") and planting them on a spot of clover or other forage, will walk with them until mid-day or even, (himself the while knitting stockings,) and having indicated to his faithful attendant the boundaries of the feeding-place, the dog will trot all day up and down, and along the boundary, and never allow any one stray *mouton* to pass the line of demarkation. We have often witnessed with astonishment and delight inexpressible, a line of 200 or 300 sheep, laboriously endeavoring to get a last bite off a parched and barren stuble, when, within a couple of feet of their noses, grew a tempting crop of clover, or luxuriant rape, from whose immediate destruction or waste, no earthly power, probably, could restrain the hungry sheep, but the perpetual watchfulness of the dog, who traversed the few inches of intervening ground, constantly trotting up and down, and anticipating the least movement of a straggler who should attempt to gratify its natural and craving propensity.

From the Scottish Farmer.

EXPERIMENTS ON THE GROWTH OF CLOVER.

It would be difficult to estimate the improvement in farming which has been consequent on the introduction of clover into the general system of cropping pursued in this country. Previous to that time it was customary to have white crops one after another until the land was exhausted, and almost the only means of restoring fertility to the tillage land was derived from the permanent grass attached to the farm. One of the standing rules in all leases, was a heavy fine should the tenant dare to plough out any of this meadow land, without first obtaining permission from his landlord. When clover was first introduced, the land owners were very averse to its cultivation, alleging that it was too impoverishing. It has, however, slowly, but surely, worked its way—so much so, that in Berwickshire, and the Lothians of Scotland, there is now little or no permanent grass to be seen: and throughout the whole of the United Kingdom (except the worst part of Ireland, where the old system is even yet pursued,) clover is now a recognized crop in every well-conducted farm.

The chemistry of practical farming is too much in its infancy to allow me to give a decided opinion, but recent investigation seems to give very plausible reasons for the place which clover has taken in our rotation. It seems that the object gained by introducing the clover between the white crops of the old system I have just named, is to allow a sufficient quantity of the silicates and phosphates, required by the cereals, to be disintegrated by the action of the atmosphere, and which, it appears, does not take place fast enough when the white crops follow each other in close succession. It can scarcely yet be considered as a settled point, yet it seems probable that each natural order of plants requires different inorganic food from the soil: though, of course, this cannot be said to be universally the case, yet there seems little doubt of it with regard to the few plants cultivated by the Farmer. The cereals and grasses of our farms belong to the natural order *Graminea*; and the clover, bean, pea, and tare belong to the natural order *Leguminosæ*. It would therefore be expected that they would require different food from the soil; and recent investigation, by analysing these different plants, so far bears out this view of the subject, that Leibig has proposed to name the former *Silica plants*, and the latter *Lime plants*;* this nomenclature being founded on the comparative abundance of silica and lime in the ashes of grass and clover. The ordinary four years' rotation, then, needs little explanation, except to say that, whilst the wheat and oat crops remove silica from the soil, the clover removes lime—to be again restored by the action of a bare fallow, or turnip corp eaten on the ground. This, of course, does not explain every thing connected with the rotation of crops; but every Farmer is aware that he cannot, even on the best land, pass on a different course of cropping from that above named without suffering in the end by diminished produce.

Though this part of the question is yet unsettled (like too many others in practical Agriculture), I think it better to give all the information which the researches of Leibig, Boussingault, and others have thrown on the subject, and look forward with every well-wisher to the Farmer, to the further results to be expected from their labours.

There are several different varieties of clover, and as they vary in their value to the Farmer, and at the same time seem to possess some different properties, I think it as well to describe them in detail.

I. *The Hop Trefoil (Trifolium procumbens.)*—This little annual plant does not form a very important part of our clover crop; it however deserves notice, as it has the important advantage of being hardy, and will grow upon land tired or sick (as it is called) of the other kinds. Cattle do not eat this clover well when it is cut green, though I have not noticed that they refuse it when it is made into hay. Seldom more than one pound of seed per acre is sown; and the plant is too well known to every Farmer, by its yellow flowers, to need further description.

II. *The White or Dutch Clover (Trifolium repens.)*—When the clover is only intended for one year's grass, I have of late years abandoned this plant; it seems so delicate, and, by the failure of the seed, yields so little produce; but when sown for two or more years' pasture, this clover furnishes an exceedingly close, sweet herbage. And every one must have noticed the beautiful growth of white clover which sometimes springs up in a meadow field, after lime has been applied as a top-dressing. This seems to be the only plant of this species on which the lime produces this effect. It is perennial.

III. *The Common Broad Clover (Trifolium pratense.)*—This is almost too well known to need description, but it is of importance to distinguish it from the next variety. As far as I can judge, the clover usually sown on a farm is a bienniel plant; though, according to Sinclair,* there is a perennial red clover (*Trifolium pratense perenne*), which it seems to be difficult to describe, as differing from this, even in botanical phraseology. I have never yet been able to find a perennial broad clover amongst the produce of the seed sown on my own farm.

IV. *The Cow Grass, or Zig zag Clover, (Trifolium medium.)*—So called from its mode of growth, which is one very distinguishing mark between this and No. III.; and it will also be observed that the latter has a light colored, heart-shaped mark in the centre of the leaves, not present in No. IV. I have been particular in pointing out the difference between this and the former variety, as the seeds are so much alike, and the broad clover, being much cheaper, is often passed upon the Farmer as the cow-grass. As there is no doubt but that the latter is a perennial plant, it is the only red clover that can be depended on for forming a permanent meadow. It has also another property, making it really valuable to the Farmer. I have found that this clover will grow when the land is quite tired of broad clover; and though it does not yield as much weight of produce, nor so good an aftermath, as a full crop of broad clover, yet the greater certainty of its growth recommends it to our notice.

V. *Trifolium incarnatum.*—This clover was introduced a few years ago; it was very much puffed at the time, but has not made its way into general use. I only remember to have seen one field of this clover in Northumberland, and one in Somerset. It is characterized by the great beauty of its flowers, and is so sweet and succulent, that if game be numerous they injure the crop very much. As it is an annual plant, it is sown on the wheat subble after harvest.

The above clovers are sown in different proportions, and mixed with rye-grass of various kinds, according to the purpose for which the field is intended. As I always sow for hay, I find about 5 lbs. of broad clover and 2 lbs. of hop† are the quantities which repeated experiments have shown to be

* 'Agricultural Chemistry.'

* '*Hortus Gramineus Woburniensis.*'

† With ½ bushel of common rye-grass.

the best for my strong wheat soils.* Double the above quantity of seed did not produce the slightest increase of crop. A neighbour, who generally allows his land to lie two years in grass, sows 7 lbs. of broad clover per acre.† His land is of a light, mossy nature; and he says that less than the above quantity has been found insufficient. I remember to have seen, upon the farm of Mr. Blandford, in Somersetshire, 14 lbs. of broad clover sown to the acre, without rye-grass, producing crops unequalled in any other part of England or Scotland which I have seen. His clover was so rich and long, that the sheep only received a few square yards, at intervals of three or four hours. Though this quantity of seed would have been quite thrown away upon an ordinary farm, it did not seem at all too much there. Every other crop was in proportion: no bare fallows, and a constant succession of green crops, upon a sound wheat soil, (formed, if I recollect right, upon the old red sandstone,) made Mr. Blandford's farm what many of the lecturers of the present day would wish to persuade the Farmers of the poor, cold clays of Northumberland and Durham their own might easily be rendered.

Clover is usually sown on the white crop succeeding fallow or turnips, and except a slight harrowing and rolling to cover the seed, it receives little attention but rolling again to break the stubble before mowing. Some Farmers put their sheep and cattle upon the clover for a short time after harvest, and again in the spring. I have often seen much harm done by this practice, upon the best soils, if the spring prove droughty; and upon strong clays it is quite inexcusable. As I am within the reach of manure, the clover is always cut twice. This, of course, cannot be recommended as a general rule, so much will always depend upon the situation, &c. A neighbour has, this last year, manured part of his clover; and as the produce was about 3½ tons of hay, I have no doubt but the 7 or 8 cart-loads of dung per acre did twice as much good as if they had been applied on the fallow two years before.—*A Farmer.*

* They are formed upon the clay slate of the coal measures.
† Along with rye-grass.

ON THE FEEDING OF FARM HORSES FOR THE PREVENTION OF COLIC AND INFLAMATORY AFFECTIONS OF THE ORGANS OF DIGESTION.

BY MR. JAMES CARMICHAEL, RAPLOCH FARM, STERLINGSHIRE.

The horse is at once the best adapted and the worst requited animal subservient to man. Originally the most healthful, but now the most sickly of quadrupeds, its whole life is a series of incessant toils, all tending to the personal gratification and positive gain of the possessor, and its death is too often occasioned by wanton cruelty or actual neglect. Nor is this ill treatment confined to any particular condition or class of horses—the cart, the coach, and the course annually consigning thousands of the noblest steeds to the dogs, at an early age, and under the most inexcusable circumstances. There is, however, one description of horses meriting particular attention, not only on account of its vast importance to the country, but also because of certain diseases to which it is much exposed, namely *affections of the stomach and bowels*, to which horses employed in Agriculture and heavy draught are well known to be more subject than any other class whatever. And this will doubtless appear to many the more surprising, seeing that husbandry horses are of all others the least from home, and consequently less liable to be affected by the temperature of different stables, or change of food or keeping; and are generally supposed to be regular in their hours of labour and times of feeding. Nor is there any thing in the grosser habit and muscular form of the common plough horse, compared to those of harness horses, sufficient to account for this striking difference of constitution, in the arbitrary distinctions of breeds under which they are severally classed. The cause of this anomily must, therefore, be traced to some other source; and if the inquiry be fairly and fully prosecuted, there cannot be a doubt that, in very many cases, those diseases will be found to originate in improper treatment of the horse under particular circumstances; and resulting from that slovenly indifference to, if not culpable ignorance of such matters, with which too many Agriculturists, and their servants especially, are often chargeable.

To establish this point, as well as to form a right conception of the maladies in question, it is necessary, first, briefly to attend to the intestinal organism of the horse, as given by the highest medical authorities; otherwise it will be impossible to illustrate the facts of the case, or convey an adequate idea of the accuracy of the inferences deduced therefrom. Anatomy shows that—"Of all creatures the horse has the smallest stomach, relative to its physical size. Had he possessed the quadruple ruminating stomach of the ox, he would not have been, at all times, ready for exertion; the traveller could not have bated his stead, and resumed his journey. The stomach of the horse is not so capacious, even when distended, as to impede his wind and speed; and the food is passing onward, with a greater degree of regularity than in any other animal. A proof of this is, that a horse has no gall-bladder.

"Another peculiarity with the horse, is the supply of fluid. When the camel drinks, the water is deposited in cells, connected with the stomach; but if a horse drinks a pail of water, in eight minutes none of that water is in the stomach; it is so rapidly passed off into the large intestines."* Let it also be borne in mind, that the whole intestinal structures of the horse are of an equally peculiar form, and very sensitive in every part; that the stomach, moreover, rests with the large intestines; its forepart is close to the liver, and its left side is in contact with the diaphram, or midriff—one of the most important muscles of the frame, and the principal agent in breathing, besides performing many other important functions, by means of its connexion with the other intestines. And thus, in whatever organ, or from whatever cause, internal inflammation may originate, the immediate connexion or sympathy of parts soon conveys the disease throughout the whole intestines.

Such, then, are the peculiar intestinal structures of the horse; and so rapid is the progress of a pail of water from the stomach through all the convolutions of the small intestines, sixty feet in length, at a moment when these sensitive teguments, and all around, are probably at a temperature double that of the liquid they then contain. What but spasms, inflammation, and death can await the poor horse, unless very prompt and efficient remedies are applied? Wet green food, given in quantity, under similar circumstances, will produce the same effects upon horses, heated and exhausted by previous hunger and fatigue. This almost every post-master and groom well knows, and studiously endeavors to avoid; and surely the Farmer ought to be equally aware of, and guard against it. Yet he complains of the loss of one and another of his best horses, by some hidden sickness, which he cannot account for; nor, until too late, discovers that the horse, having returned from his last day's work covered with perspiration, or shivering under rain, was led to the water-pond, plunged in, and drank his fill, then put into the stable, and served with such provisions as came to hand, fresh or fusty, and left for the night, without a single hair being touched with whisp or comb. The servant may be also young and inexperienced;—but why is he intrusted with horses, or not properly instructed in the first principles of his duty towards them?

There are other causes of an opposite character, where, from the propensities of the servant, in mistaken kindness to the horse, or even with the consent of the inconsiderate master, horses are served with corn unseasonably, or in excessive quantity, or of unsound quality. "*Stomach Staggers*" soon ensue, and instances might be related of horses dropping down dead in the yoke in this state—the stomach having become ruptured by the over-distension or swellings thus occasioned, either from the too full a feed of any kind, or partaking of food of an improper nature, or even drinking an excessive quantity of cold water, and then put to severe exertion. A case of this description came under the writer's notice very lately,

* *Vide* Sir Charles Bell's *Notes on Paley's Natural Theology*, vol. ii. p. 319.

where a valuable farm horse, in high health and condition, having, in the throng of seed-time, been served at mid-day with a quantity of bean *keavings* (chaff,) or a mixture of the bruised beans and leaves, of which horses are very fond, and, though naturally flatulent, are quite safe as an evening or an idle day's foddering; but being in this instance given immediately after a feed of oats, and the horse having thereafter obtained his pleasure of water on his way to the yoke, he had not proceeded many boutings with the harrows when he shewed every symptom of excruciating pain, and, in a little more than two hours, died in the greatest agony, of a ruptured stomach. And in another instance, a mare, with a voracious appetite, having been depastured the night in a field abounding in white clover, very ripe and parched with dry weather, on being next morning taken to a cold spiing, drank a great quantity of the water, was then put to the plough, where she shortly became very unwell, and on being taken to the stable, was dozed by an ignorant blacksmith, with spirits, ginger and pepper, until inflammation of the kidney supervened, and death ensued. Horses have also been known to die of inflammation of the bowels, from eating new washed raw potatoes, when warm from the yoke.

In addition, however, to such casualties as these, there are other latent sources of disease, arising from the mode of keeping the natural, and preparing the artificial food of many farm horses, as well as the manner of supplying it. The small Farmer, in particular, generally throws the straw into large *mows* or heaps, or low damp floors, where it becomes musty; or stows it in the confined loft of a crowded stable, where, fumigated with the exhalations from beneath, the empoisoned mass is dealt out to the devoted animals, who thus become the innocent victoms of various diseases, if not of subsequent destruction. Or, if a portion of the food is boiled or steamed, it often wants the most essential ingredient of the whole, a proper quantity of salt; so that the mess is probably sour ere it is administered or immediately becomes so in the animal's stomach.

Then there is the half rotted, frosty-cut clover, or aftermath, at the close of the autumn, so pregnant with danger to the farm horse, all of which dangers the harness horse escapes, by a more uniform course of keeping. The latter is chiefly fed on corn and hay, and is regularly supplied at intervals of three or four hours at most, according to his work or stages; while the farm horse has his consecutive yokings extending to ten or twelve hours a day, often more, with but little intermission for baiting or rest; has less corn, and in general subsists nearly two-thirds of the year on coarser fodder, (oat or bean straw,) which fills the stomach without affording much real nourishment.

Let it not, however, be said that the fresh straw of the common crops of the farm, together with the customary feeds and mashes duly served, are insufficient to maintain the horses in proper condition, under ordinary circumstances, without the aid of much, or any hay. Nothing is so easy and obvious than to prepare the food of horses in a proper manner, although it certainly requires some care, activity and arrangement, on the part of both master and servant. If, for example, in commencing with the fodder of the new crop and until the system of steaming becomes more general,—if the new straw were mixed with sweet dry straw of the previous season, or sprinkled with a few handfuls of salt, as it comes from the thrashing floor, it would greatly promote the health of the horses, as well as of the other stock; and provident Farmers always reserve one or two stacks of corn or pulse, for the purpose of being so mixed or used alone, till the straw of the new crop becomes seasoned by a few weeks in the stack,—as peas or beans, beans especially, are very flatulent, if taken new or in a soft state, but excellent fodder thereafter, and are much relished by horses accustomed to it. And when the leaves, pods, and chopped stems, or chaff of beans, and the *tails*, or small corn from the winnowing machine, are mixed and boiled, or steamed, together with some turnips or potatoes seasoned with salt, and given lukewarm in lieu of oats to the jaded horses, as they return in the evening, the benefits are apparent in their plumper form and glossy coats. It is by means of such mashes, or by combining the corn with the chaffed hay, that old and wearied horses are enabled to masticate so easily, and lie down so readily to repose; while others must stand several hours knawing their ill-suited ration, or hastily swallow it in a crude state to stifle the cravings of hunger, and then lie down to die of cholic.

Carrots and Swedish turnips, well cleaned and dry, may safely be given in an unprepared state, when the horse is cool, and not attenuated with warm food; and the second crop of clover, if early made into hay, and slightly salted, with or without a mixture of old hay or straw, might be made greatly more available for all kinds of stock, instead of remaining uncut till late in the season, bleaching under every change of weather, and then given to the horses in a half-rotted green state.

These remarks may suffice to shew that the causes here assigned, as inducive of the maladies referred to, are not gratuitously assumed, and that the subject really claims the immediate attention of all interested in preserving the health of the horse. The means of preventing such diseases are therefore the more obvious, inasmuch as the cause and effect are thus placed in juxtaposition; *pari ratione*, the remedy must be apparent, and prevention more meritorious than cure. In place, then, of presenting a pail of cold water to a warm horse, a little tepid water should be substituted—the mouth being previously washed, and freed of coagulated saliva, with cold water, and the horse stripped of every encumberance, carefully rubbed down, and allowed to stand picking at dry hay or straw till cooled, before any cold water or corn is given him, or he be turned out to pasture. For not more grateful is a change of raiment to the dripping teamsman himself, on escaping from the drenching rain, than is a thorough cleaning from mud and sweat to his smoking steads, just relieved of their heavy draught. Yet in nothing are farm-servants in general more negligent: nor are those men otherwise to be taught but by the watchful superintendence and strict discipline of the master, seasonably enforced—not merely in the uniform treatment of the horse, in and out of yoke, but to the state of the stable, which can hardly be too clean, or over-ventilated—a point almost wholly overlooked on many farms. How many districts may be traversed without seeing a single roof-ventilator, or even a hole in the wall of the stable or cow-house. It is well to have separate houses for the provender, as contiguous as possible to the stable, but not connected with it by any party-door or hatch, which never fails to act as a conductor of the heated atmosphere of the stable into the connected apartment, in the same way as it passes through the racks and crevices of the stable loft, which is often hotter than the stable itself, especially under a tile roof. Such a plan would supersede the use of high racks, so awkward and unnatural to the horse, and so wasteful of his food; while he, with much greater convenience, could feed either standing or lying from a manger or sparred crib in one angle of the stall, with a corn-box in the other.

Of the best mode of curing inflammatory complaints, it were superfluous here to treat at length, as it manifestly must lead to a still greater aggravation of an evil, already too extensive, were every Farmer in each intricate case to become his own farrier, without any tuition, and put in possession of a few recipes, or certain potent medicines, the properties of which he neither understands nor can properly administer. And grievously, indeed, would the patronage and funds of the Highland and Agricultural Society be wasted, in the establishment of a veterinary college under an able professor, should any one, Farmer or not Farmer, decline the inestimable boon of obtaining the assistance of a competent veterinarian provided for them, and in progress of being placed within the reach of the remotest cottage in Scotland. No, the Farmer has suffered enough from his own apathy, and the quackery of common blacksmiths who must needs pretend to the veterinary art, and whose pharmacoperia almost exclusively consists of stimulating drugs. Every disorder was termed '*bots*;' and *worms bots, and colic*, were confounded together and treated alike.

Science, however, has now happily expunged 'bots' from

the vocabulary as perfectly innoxious, and found other and safer vermifuges than those formerly resorted to.

Let the Farmer, then, simply attend to the first symptoms of disease, and minutely investigate every particular relative to the animal's situation, work, food, and drink, during the preceding day or night. A knowledge of all these is indispensible to a discrimination of the complaint; and if servants will tell the truth, or whether they will or no, and the real cause may frequently be discovered by the Farmer himself, and thereby greatly facilitate the cure. Meantime, if need be, four to six quarts of blood may be taken, according to condition, from the horse, in *almost every case of sudden indisposition;* or should it prove to be a spasmodic colic, two to three ounces of oil of turpentine, added to a pint of warm ale or gruel, will generally afford instant relief. But farther than this no one should venture without the presence or permission of a veterinary surgeon, or some other experienced farrier, whose advice must instantly be sought and implicitly followed; for such, it is seen is the extreme sympathy of parts pervading the whole system, that injudicious applications greatly heighten and rapidly extend disease. To illustrate the propriety of urging these precautions, it is only necessary to add another fact to those already adduced, by stating, that a horse lately under a dose of a shop-bought strong medicine, requiring the total withholding of green food during its operation—but the nature of the medicine being misunderstood by the attendants on the horse—green food was given, and the poor animal died in the course of a few hours thereafter, of entanglement of the intestines, brought on by the arrant neglect of not requesting the assistance of a veterinary surgeon.

MANAGEMENT OF CALVES.

It is almost certain for a well-bred calf to come small; the smaller the better if well proportioned. I have seen numerous large calves, but never saw one that grew up to a good animal. This assertion can be endorsed by most of the best breeders in England, and in this country; in the former the larger ones are generally selected and fattened for the butcher, at from six to eight weeks old.

I have reared calves in almost every way. They have run with the cows the whole summer. I have kept them on new milk for two months, then have given them half new and half skim milk. I have kept them entirely on skim milk; and on a little new milk and linseed jelly. At the present time, I am raising them on two quarts of new milk, night and morning, mixed with half a pint of linseed jelly. At three weeks old, I reduce the milk to three pints, and add another half pint of jelly. At five weeks, I give them a quart of milk only, and add another half pint of jelly. By this time they will begin to eat some shorts and hay. The best cow I ever bred, or ever had, was reared on skim milk; and many who saw her in the field with her round swelling paunch (amongst others of a similar character,) though she was nothing more but a common calf, the whole of them looking to an inexperienced eye like "common stock," but they all grew up superior animals.

If many of the "full-blooded" fat bull calves had been killed, to rejoice over the reform of rich men's prodigal sons, this "humbuggery" in cattle would not have been so effectually established, and the money spent in dash and show applied to procure the best, what a different picture would have been drawn. So long as some men have the credit of being called rich, and fat their mongrel calves to gain a great name, and have no care beyond it, they little imagine the tottering foundation they stand upon, and how soon they must be detected; the lenient hand of time will prove them but emptiness and vanity. They gain no superiority in this world, and are a laughing stock for the more enlightened class of the community. But enough of this, let them gallop on, it will not last for ever.

I firmly believe that calves brought up sparingly and economically, prove much better, and more profitable animals, than those that suck the cows. It is a more sure way to develope the frame, muscle, and milk vessels of the female. I have no doubt the secretion of milk, is formed at a very early stage, and when the calf is sucking all the milk from a good dam, the frame is covered with fat and lean meat; and it appears very plausible to me that while this meat is increasing with the rich food, the vessels for the secretion of milk are diminishing, and such an animal must be extravagantly fed, after leaving the dam, to keep up its condition, It is almost impossible to find food equal to what it had left.

There is nothing more deceiving than a fat bull calf, and thousands have been most meanly disappointed. If he is left to chance, he gradually degenerates in appearance; his frame, muscle, and sinews, all grow weaker, as the flesh disappears, and a young animal so reduced, is much injured in constitution, and often produces disease and death. How often have inexperienced men purchased such calves when their bad points have been covered; and when poverty has exposed their true character, they very justly condemn both the calf and its breeder, and become disgusted with what is called "blooded stock," for no other reason than because they have been imposed upon by a large fat calf.

A Hereford does not look so well when a calf, as a short horn, and I admit that a short-horn shows better until after two years old; but the third year a Hereford will develope itself and come out triumphantly; and no animal should go to the shambles until three years old. There is no profit to either feeder or butcher if killed at an earlier age, unless it is near a market, where butchers will pay a remunerating price for good veal. Cows kept on purpose to fat Calves for market has been a lucrative business. I know many Farmers in England, who confine themselves entirely to this practice, and feed from six to nine calves per year on each Cow. Aylsebury market in Buckinghamshire is generally full of carts loaded with young calves destined for this purpose, and many a man gets a good living by keeping a horse and cart, buying them of the farmers as soon as dropped, and selling them to their regular customers who constantly attend that market. It is the largest market for such young animals in England, being near enough to convey them to London daily. There is so much grass land in that neighbourhood suitable for the business. I am decidedly in favor of having calves come in October, November, and December. At that time skim milk can be kept sweet, and if they are kept in a warm place they will do much better than in summer. In warm weather your milk soon becomes sour, and then they will not drink it, or even if they do, it does them injury; it purges and weakens them; their hair stands the wrong way; they suck each other's ears, and drink each other's urine, and frequenty die of extreme poverty. If calves are well and economically brought up in the winter, and turned out to good grass in the spring, they thrive surprisingly; and the next winter they will live on the same kind of food as yearlings bred the previous spring, and will continue to do well until they arrive at maturity, with proper care. A bull can be turned out with them six months earlier than a spring calf; they will come in at two years and a half old with nearly as much constitution and vigor and probably better milkers. I like to have heifers come in the first time, when they have a good bite of grass. If the calf is taken away at three days old, she will come in the second year two and a half months earlier, the third at the right season, and the butter made from the cows in winter will fetch from three to six cents per pound more than tub butter. I sold mine for 18 to 25 cents in Albany, when tub butter was worth only 12½ to 14 cents; and it is less trouble to make it in winter than in summer. Much more milk and butter can be made from hay that is cut young than that left to grow to maturity.—*Wm. H. Sotham, American Agri.*

VEGETABLE INSTINCT.

Of all plants, the confervæ alone possess the power of locomotion, properly so called; and perhaps of all plants they alone consist of solitary individuals. Other plants are composed of communities, the buds (as I shall have some future occasion of shewing you) being the inhabitants, the stems consisting of store rooms and galleries, the little spongy bo-

dies at the extremities of the roots being the true locomotive organs—the honey bees of the hive, collecting and elaborating the sustenance of the body politic; and if you expect trees to dance hornpipes for your diversion, you must get some city or bee-hive to set them the example. But if trees, as a whole, do not walk upon the surface of the earth, they in other respects exhibit abundant instances of spontaneous motion. For example, the tendency of plants to incline their stems, and to turn the upper surface of their leaves to the light; the direction which the extreme fibres of the roots will often take to escape from light, or to reach the best nourishment; the folding up of the flowers on the approach of rain; the rising and falling of the water lily, and the peculiar and invariable direction assumed by the twining stem in ascending its prop.

If a pan of water be placed within six inches on either side of the stem of a young pumpkin or vegetable marrow, it will in the course of the night approach it, and will be found in the morning with one of its leaves floating in the water. This experiment may be continued nightly, until the plant begins to fruit.

If a prop be placed within six inches of a young convolvulus, or scarlet runner, it will find it, although the prop may be shifted daily. If after it has twined some distance up the prop, it be unwound and twined in the opposite direction, it will return to its original position, or die in the attempt; yet, notwithstanding, if two of these plants grow near each other, and have no stake around which they can entwine, one of them will alter the direction of its spiral, and they will twine round each other. Duhamel placed some kidney beans in a cylinder of moist earth; after a short time they commenced to germinate, of course, sending the plume upwards to the light, and the root down into the soil. After a few days the cylinder was turned one-fourth round, and again and again this was repeated, until an entire revolution of the cylinder had been completed. The beans were then taken out of the earth, and it was found that both the plume and radical had bent to accommodate themselves to each revolution, and the one in its effort to ascend perpendicularly, and the other to descend, they had formed a perfect spiral. But, although the natural tendency of the root is downwards, if the soil beneath be dry, and any damp substance be placed above, the roots will ascend to reach it.

The roots of the phleum pratense, when growing in a moist soil, is uniformly fibrous; but when growing in a dry situation it is furnished with a bulbous root, bulbs being store houses for supplies in times of scarcity. The same is the case with the alopecurus geniculatus.

A tree growing from an old wall, or cleft of a rock, will, as soon as it has exhausted the surrounding soil, send a stem down to the land beneath. This has been particularly remarked of the elm and ash in England, and the arbutus in Glengariff, and the cliffs overhanging the lakes of Killarney, in Ireland.

The colchicum autumnale, a bulbous plant, pushes up its blossoms in autumn on a raised footstalk, the hollow in which communicates with the ovary, which is placed several inches beneath the surface of the ground, where the seeds are matured, and remain in shelter until the approach of summer, when they rise above the surface to ripen, and become distributed.

The plants in a hot-house do not direct their leaves to the stove in quest of heat, or the open door in quest of air, but to the sun in quest of light.

Plants in a cellar or dark room struggle towards the light; plants in an area turn the upper surface of their leaves towards it; on the contrary, their roots sedulously avoid it.

The tendril of a vine, or the stem of a creeping plant, never makes any turn until it comes in contact with some object around which it can entwine; after which, it proceeds in a spiarl direction around the object held in its embrace.

The strawberry plant will thrust its runners completely across a garden walk on to a bed of soil on the opposite side, where it will for the first time, as it were perceiving its object to be gained, push out roots, and form a new plant. Trees have been found which have taken root on one side of a deep ravine, and having exhausted the sterile soil on that side, have pushed their roots across the abyss, and having gained the opposite side, have there struck deep root into the fertile soil.

An eminent modern writer narrates that among a collection of palm-trees cultivated by the Messrs. Lodiage, of Hackney, was one furnished with hooks near the extremity of each frond, evidently designed for attaching it to the branches of trees for support, when growing in its native forest. The ends of the fronds were all pendent but one, which, being nearer to the rafters of the conservatory, lifted its end several feet to fasten to the rafter; none of the other fronds altered their position as they could not have reached the rafter had they attempted to do so. What a striking recognition in the tree of an evident fortuitous circumstance.

The Pandanus, a native of the Isle of France, sends out roots from the stem for support. If the tree leans to one side, endangering its safety, it puts additional roots at some distance above the rest, at the inclining side, which reach the earth, and form supports to the trunk perfectly analogous to the shores and timber work used by architects to prop a building in danger of falling.—*South Australian.*

APPLICATION OF MANURES.

In the present modes of bringing manures in contact with the soil, the two substances lie in masses of greater or less magnitude; and when the aggregations are pulverized and comminuted, they still lie separate, and the exterior surfaces are the only parts that come in contact. This application is against the fixed law of chemistry, that bodies must be in a very finely reduced state, and be opposed to each other at insensible distances, or no reciprocal action can take place, and consequently no combinations or dissolutions will ensue. And hence when farm-yard dung is laid into drills in the form of lumps and masses, or is ploughed broadcast into the land, the pulverized soil comes into contact *only* with the exterior surface, and can derive no benefit from the interior part that is removed from action. And, further, the growing plants are benefited *only* by the reciprocal action of the substances of which the manure is composed, without any assistance from the soil in combination.

These reflections arise from the common mode of applying manures, and of the chemical notions of the reciprocal actions of bodies. Dissolution of bodies takes place in consequence of different electrical states, and may be altered and modified by many necessary and contingent circumstances. Chemists are at present occupied in relating the constituents of manures and of the plants that are produced—which is wholly useless? for the certainty is known that substances that are applied as manures do not pass unaltered into plants, and become the same substance in the constitution of the vegetable. Animals and vegetables supply themselves with the necessary elements from different food by some process of organic actions, of which we may remain for ever ignorant.

The object of chemistry should be to investigate and explain the relative actions of bodies on each other, and the results of the combinations and dissolutions. The bare knowledge of constituent elements leads to no useful practice, and without that essential result accessory science is a mere nullity. J. D.

ARTIFICIAL MANURES.

Nitrate of Soda.—Nitric acid and soda.—A natural product, imported from Peru. One and half cwt. per acre, sown broadcast, with half its own weight of ashes or mould, for wheat, oats, grasses, &c.

Nitrate of Potass, Saltpetre.—Nitric acid and potass.—A natural product imported from the East Indies. One cwt. per acre, sown broad cast, in the same manner as nitrate of soda, for wheat only.

Petre Salt.—Common salt and nitrate of potass.—The residum of a manufacture. Five cwt. per acre, sown broad-cast, as a purifier of grass lands, and calculated to encourage the finer grasses.

Gypsum, Sulphate of Lime.—Sulphuric acid and lime.—An abundant mineral in several parts of England. Two and a half to three cwt. per acre, sown broad-cast, on clover, trefoil, sainfoin, and other grasses. Success somewhat doubtful.

Sulphate of Ammonia.—Sulphuric acid and ammonia.—The residum of a manufacture. Two cwt. per acre, mixed with a little mould, and sown broad-cast, for clover, oats, &c., and drilled for turnips. A good combination of ammonia, useful for green crops.

Bone dust and Half-inch Bones.—Phosphates of lime and magnesia, carbonate of lime and animal matter, yielding ammonia. One and a half quarters to twenty bushels, drilled, or sown broad-cast, mixed with ashes, for turnips, vegetables, wheat, &c., if dissolved in acid, four to five bushels per acre.

Calcined Bones.—The same constituents as the above, with the exception of animal matter. For mixing with farm-yard dung, and other manures containing ammonia. A wasteful process at best.

Phosphate of Ammonia.—Phosphoric acid and ammonia. For mixing in compost, and furnishes from its constituents much nutriment to vegetation. A most invaluable combination, and useful for all crops.

Muriate of Ammonia.—Muriatic acid and ammonia. Applicable in the same manner as sulphate of ammonia.

Muriate of Lime.—Muriatic acid and lime. For mixing with compost heaps.

Sulphate of Magnesia.—Sulphuric acid and magnesia.—Mixed with night-soil for potatoes, one cwt. per acre, or to eight loads of stable dung.

Soda Ash.—Lime, magnesia, alumina, charcoal, silica, and a few other ingredients in smaller proportions.

Phosphate of Lime.—Phosphoric acid and lime. This manure is easily blended with farm-yard litter, &c., or may be usefully drilled alone.

Superphosphate of Lime.—Phosphoric acid and lime, in a more solable state than in bones, prepared by dissolving bones in sulphuric acid. For mixing composts, fixing the ammonia of dung-heaps and urine-tanks, and forming phosphate of ammonia. A capital mixture.

Guano.—The dung of sea birds, imported from Peru, &c., and containing various salts of ammonia and phosphates. Three to four cwt. sown broad-cast, for grass, turnips, mangel-wurtzel, or other green crops, mixing with the soil is very desirable. In preparing for turnips, no plan is better than to pound and sift the guano, and scatter it, broad-cast, on the surface; then ridge up. For potatoes we act somewhat differently. We sift and sow, broad-cast, in the ridges after they are made, and then pass a horse-hoe down the ridges, so as thoroughly to mix the soil and the guano, and then plant the potatoes; this intremixing prevents injury to the seed. It is dangerous, because it is generally injurious to make mixtures, so little is known what they will do. The alkalies in wood or house ashes may very much injure the guano by volatilizing the ammonia.—*J. R., M. D., in Farmers' Journal.*

Bones.—The soil on which they are the most valuable is precisely that which most needs something extraneous—viz. light loose sand. Black sand is most benefited by them. Sixteen bushels per acre of bones, alone weighing perhaps three and a half hundred weight, are more productive of a crop of turnips than two hundred weight of farm-yard manure, on soils of the above description. Peat, yellow or white sandstones next, gravelly and loamy land last; while on clay soils they seem to have but little effect. The turnip crop seems to be most benefited by the bones, and when they secure, as generally they will, a full crop of turnips, and these are consumed upon the ground by sheep, there is the greatest certainty of a full crop of barley, of clover to succeed that, and of wheat to follow, when it will be necessary to introduce turnips again. I have known a field which grew very indifferent turnips produce four crops of turnips, and four of clover, and eight of corn, in sixteen years, by four applications of bones alone, at the rate of sixteen bushels per acre. The bones applied would weigh fourteen hundred weight, and the amount of produce realized would weigh at least one hundred tons; while the land was left for any crop more productive than it was before.

SAWDUST CHARCOAL.

Mr. Woolrych Whitmore was lead to make a few observations on the success with which he had employed charcoal obtained from sawdust, and the various refuse vegetable matter collected on his property, as general manure for garden and field use, especially when mixed with bone, prepared according to the plan recommended by Mr. Pusey, in the proportion of one-third bone with two-thirds charcoal, employing water only as the liquid for moistening the heap, and of promoting its fermentation, and the result that was obtained in the course of a month or five weeks; and he had found no artificial manure at all equal to this fermented mixture. He found that raw sawdust did not succeed, but that charred sawdust, or sawdust charcoal, did admirably. He also ascertained that there was a mechanical advantage in sawdust, or wood charcoal, in producing this effect, not met with in charcoal obtained from couch-grass, and other charcoal from plants, the latter appearing to be more compact, heavy, and impervious in its mechanical condition, which impede its action in promoting fermentation. This charcoal was, therefore, employed alone as a top dressing. Mr. Whitmore had not at present devised a convenient mode of reducing his sawdust to a state of charcoal? but he had no difficulty with other substances, such as couch and other weeds, the clippings of trees, cabbage stalks, &c.; these he piled round an upright pole into conical heaps, and covered them up with earth; the pole was then gently withdrawn, and a vacancy being thus left in the heap, from the bottom to the top, where the pole had occupied a space, a flue was formed which after ignition greatly facilitated the charring or slow combustion of the surrounding vegetable matter.

Professor Way remarked that the use of charcoal in agriculture was by no means carried to the extent, to which, in his opinion, it ought to be. It was a substance that stood midway between a chemical and a mechanical agent; absorbing to a great amount various gasses and vapours, and especially the volatile ammonia so often produced during decomposition and allowed to escape into the atmosphere. Had he not just heard from Mr. Whitmore, that charcoal and bones, mixed together, underwent fermentation, he should have thought that charcoal would have had the effect of retarding or even of preventing that process. As ammonia was disengaged in the decomposition of bones, the presence of a porous substance with the imbibing properties of charcoal, would at once secure that volatile element, and prevent its escape, rendering the artificial manure produced so much the more valuable. He had understood from Mr. Parkes, that Mr. Outhwaite, a friend of his in Yorkshire, who was an excellent practical farmer, converted not only the clippings of hedges and weeds, but also all his refuse straw into charcoal, which he employed largely on his land. Charcoal had long been employed as an antiseptic, removing from decaying bodies their ill odour, as well as their tendency to putrescence; and he believed that charcoal would be found one of the best preservatives from milldue in the turnip crop, that injury being understood to arise generally from a peculiar condition of the soil.

Col. Challoner would have a small extent of one of his turnip fields immediately set apart for an experiment, and would drill in charcoal with seed to the amount of some 10 to 20 bushels per acre.

Professor Sewell on two successive showery days in 1846, had 25 acres of turnips sown, which yielded the most luxuriant crop; while 100 acres, sown on an adjoining farm when the dry weather had set in, proved almost an entire failure.

Mr. Whitmore expressed his intention of presenting to the society all the details he could obtain on this subject.—*Dublin Farmers' Gazette.*

A NEW MODE OF TRANSPLANTING THE SWEDISH TURNIP.

On the 29th of October last some interesting particulars as to a new practice in Swede transplanting having been submitted to a meeting of the Rhins Farmers' Club, and discussed, I was directed, as their secretary, to transmit some of the results to Professor Johnston, of the Scottish Agricultural Chemical Association, to analyse; "also to investigate into the facts and whole circumstances, and report to a future meeting," which I now beg leave to do.

Previous to giving the analysis furnished by Professor Johnston along with his valuable paper, entitled "Suggestions for Experiments on the Cultivation of Turnips," I beg to preface a short account of the circumstances transmitted to that gentleman, explanatory of the mode of culture and treatment attendant on the growth of the Swedes referred to.

Mr. Johnston, Larg Liddesdale, not being able to get a piece of good loamy clay ground drained and limed sufficiently early, (after his entry on 26th May, 1847,) had resolved to raise Swede plants, and to transplant them when his ground was ready. He sowed his seed in a sheltered bed early in April, but could not get them transplanted before the 22d of June. Soon after transplanting, say from 12 to 20 days, Mr. Johnston noticed the plants showing decided symptoms to run to seed, and many actually flowering. He naturally enough thought they would do no good, and the greater portion was removed and their places supplied with kail plants. But, accidently, some of the turnip plants were cut in the stalk for the pigs and cows, instead of being pulled. These Mr. Johnston soon observed (in twelve or fourteen days) not only to be sprouting rapidly, but bulbing also. All the plants still unpulled and uncut he then cut over; and soon afterwards he found they had gained considerable foliage, their bulbs increasing as quickly, notwithstanding, as turnips sown along side of them in the ordinary way. The consequence was, he was able to continue cutting for upwards of three months, no less than 3 heavy crops of green food for his cows, from the transplanted turnip so managed. At the meeting of the Rhins Club before referred to, (quoting from the minutes,) "Mr. Johnston, in order fully to show the way in which the turnips had grown in the stems and leaves, after being cut, brought the turnips just as they had been pulled, and laid them on the Club table. We shall now describe the appearance of the plants. The stems and shaws were not luxuriant, owing to their having been cut over not long before; notwithstanding, one bulb (with the leaves) weighed 18lbs., and another 15lbs. The latter turnip was well proportioned, having been cut in the stem pretty close to the shoulder of the bulb, which caused no less than fourteen new stems to spring up in a circular form round the cut neck; the consequence of which was the growth of corresponding rootlets, as feeders, all round the base of the turnip. The 18lb. turnip had been cut higher up the stem, and did not throw out its new stems numerously and equally, or bulb gradually in the elongated globular form." The kind was of Skirving's Swede, the seed being got from Mr. Hugh McCullock, Seedsman, Stranraer.

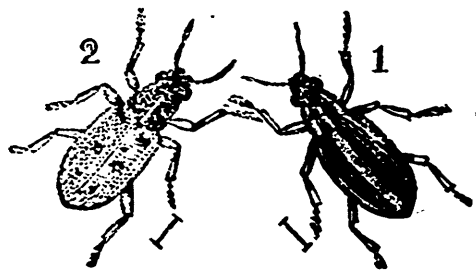
TRANSPLANTING SWEDE TOPS.—I have derived no one piece of information more valuable from your paper than cutting off the tops of the Swede Turnips, and planting the same; and I venture to declare it to be one of the most productive manœuvres every brought forward, taking all circumstances into consideration. It cannot be too strongly recommended to the poor cottager.—*C. P., of York.*

From the Gardeners' Chronicle

ENTOMOLOGY.—PEA WEEVILS.

It will, we fear, be considered but sorry consolation to some of our readers who are suffering from the attacks of insects, to tell them it is a part of the great plan of the Creation that the vast and redundant masses of vegetable matter should be kept in check, and that consequently those families of insects which are destined to this purpose are far more extensive, both as to species and individuals, than such as feed upon animal matter. To say nothing of the great tribes of butterflies and moths, which feed in the caterpillar state almost exclusively upon vegetables, there are several families of beetles employed in the same manner—some feeding upon the solid wood, others upon the bark; some on the flowers and others on the leaves. Of all these tribes, the family of the weevils is one of the most extensive, as will be perceived when it is stated that its investigation, just completed by M. Schönherr, a distinguished Swedish entomologist, occupied him more than 30 years, and occupies more than 7000 octavo pages in printing.

In England we possess between 400 and 500 species of weevils, and the wonder, therefore, is not that occasionally, as in the present year, one or two species become troublesome, but that we do not constantly suffer from their attacks upon our vegetable produce to a much greater extent. We have received a number of complaints during the few past weeks of the injury committed to the Pea crops by two small weevils (Sitona lineata and tibialis), which have abounded to a great extent, gnawing off the young leaves and stems as soon as they are above ground. That the long continuance of hot, dry weather has allowed their attacks to be continued uninterruptedly, is evident. We must attend, however, to the natural history of the insects, and as they are now in their perfect state, and require a year's time to undergo their transformations, their increased powers of annoyance at the present time are not owing to the fine weather having enabled them to perpetuate their species rapidly, as in the case of the plant lice. Any remedies, therefore, which we can suggest, must have for their object either the destruction of the perfect beetle or the protection of plants, neither of which is easy. As to the former we scarcely think that any trap could be employed into which the insects would creep at night, (like damp Grass into which the wireworms creep, or bits of Potato put into the ground to which as food the same insects are enticed): possibly, however, dry hay laid along the rows might entice them into it as a retreat. Another means of destruction suggests itself in connection with the habit of the insect of falling to the ground on being surprised. A bag net (about two feet deep), and with one side flat so as to allow of being placed on the ground close to the sides of the rows of Peas, would, we think, be serviceable. This might be run along the rows, the plants being slightly swept over by a switch held in the right hand, the handles of the bag net being held in the left hand; or perhaps by merely running the net along or across the rows they might be jerked into it.



As to the protection of the plants, soot and pounded lime have been suggested to be sprinkled over them, previously wetting them with a watering-machine. In this respect the same kind of remedies must be used as have been proposed against the Turnip flea-beetle, having for their object the rendering of the plant disagreeable to the insect by a coating of matter offensive to its taste, or by forcing forward the growth of the plant as quickly as possible.

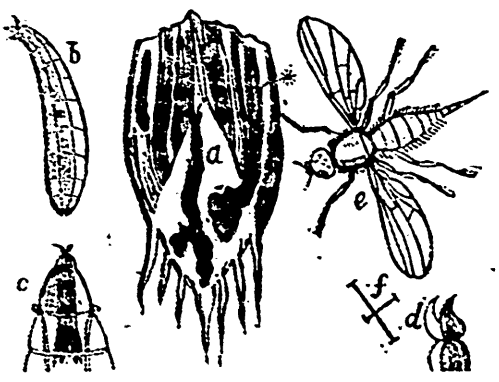
In a note just received from Mr. Samuel Webb, gr. to C. Fardell, Esq., of Holbeck Hall, near Horncastle, Lincolnshire, he informs us that the weevil was up to that period committing very serious ravages upon the Pea and Bean crops in that county, and that he had found the greatest service from turning several hens with their broods of chickens into the fields, the hens being tied by the legs and moved from place to place, to prevent them from rambling away. We may also suggest the possibility of advantage resulting from drawing a cloth covered with pitch or tar over the rows of Peas; the insects would become fixed to the cloth and might be easily destroyed.

The Celery Stem Fly.

In our volume for 1841 will be found a history of a very beautiful two-winged fly (Tephritis onopordinis), which is occasionally very obnoxious to the Celery crop, the grubs of which form large blisters upon, or rather within, the leaves, devouring the parenchyme, and preventing the due circulation of the fluids necessary for the support of the plant, by entirely destroying their substance. On the present occasion we purpose making known the proceedings of another two-winged fly which is equally injurious to the same plant, but in a different manner the larva burrowing into the solid stem and fleshy stalks working its way up the latter, its track as well as itself being at first almost invisible from its similarity in colour to the substance of the stem; so that we have no doubt portions of the stalks, although containing the grub, are often eaten, owing to its presence not being saspected. The eye of the entomologist however, especially if assisted by a moderate lens, easily detects the unwelcome visitor, which may indeed be expected when the solid part of the stem shows traces of being worm-eaten. It would seem, in fact, that it is in the solid part that the injury is commenced, the grubs eating upwards into the more succulent stalks of the leaves, leaving their traces in the former, visible in their tracks, which become rusty red, owing to the action of the moisture and air upon the gnawed surface which they have quitted.

Our first acquaintance with the transformation of this insect took place in the month of February, and as at this period the Celery has become more valuable, from the small quantity of stock remaining unconsumed, it is doubly annoying on digging up the plants to find that they are more or less worm-eaten. By careful examination, and removal of the leaves, the authors of the mischief may be found in their burrows, in the shape of glossy white cylindrical grubs, with a slight yellow tinge, having the anterior part of the body pointed, and the hind part obtusely rounded and marked by two black points; from whence proceed two delicate air vessels, appearing like threads of gold beneath the transparent skin, and which run along the whole length of the body as far as the segment immediately behind the head, where they form two minute exserted appendages.

The hind joints of the body are indistinct, but the fore ones are more distinctly to be traced. The mouth consists of a black horney apparatus, capable, as well as the head itself, of being withdrawn into the subsequent segment, as far as the two exserted lobes of the air-vessels above mentioned. Our figure *a* represents the bottom portion of a small stick of Celery, with two burrows in the solid part, one of which extends up into the right hand stalk of the leaf, where the grub is seen at*. The grub itself is drawn of an enlarged size in fig. *b*; and in fig. *c*, the front of its body is still more highly magnified, showing the two air-vessels terminating in the two external tubercles, and the large horny apparatus of the mouth terminating behind in four horny points, and in front in two horny hooks, (see fig. *d*,) moved by strong muscles, and used by the insect in raking up the particles of its food, which it then sucks into its mouth.



By placing some of these diseased Celery stalks in a pot of moist earth, we succeeded in rearing from them the fly into which these grubs are transformed. Previous to assuming the perfect state, however, the insect has to pass through that of the pupa, in which the skin of the larva becomes hard, and forms a shining elongate case, without any appearance of articulation. Within this elongate-oval case the real pupa is to be found from which the perfect insect was disclosed at the middle of the month of May. This fly very closely resembles that reared from the cheese maggot. As it does not appear to be described we propose to name it Piophila Apii. It is represented above in our figure *e*, its natural size being shown by the crossed lines at *f*. The thorax and abdomen are entirely jet black, and very glossy, with a very slight brassy tinge, and with fine golden grey hairs scattered over the body. The head is chesnut-coloured, paler near the mouth, and black in the middle above; the eyes and club of the antennæ are pitchy the bristle of the latter luteous. The legs (including all the coxæ or joints by which they are attached to the body) are very pale straw-yellow; the tarsi, especially in the hind feet, somewhat more dusky. The wings are entirely hyaline and colourless, with the veins very pale buff. Our figure represents a female,* in which the ovipositor is seen to be exserted, consisting of several very slender joints, which are retractile, like the tube of a telescope.

Although this insect is hatched in the beginning of the summer, it is, most probably, either that it survives till the autumn, or that there is a summer generation; at least, we presume that the grubs which injure the plant in the winter and early spring months are hatched from eggs deposited by the female fly in the autumn. We know no plan for preventing this operation, or for entrapping the fly when arrived at the perfect state. When, however, stalks of Celery are found to be much infested, the diseased parts ought to be cut out and burnt, instead of being thrown, as is generally the case, upon the dung heap, to rot with other refuse vegetables, whereby the destruction of the fly is not effected.

* In this figure the abdomen is represented rather too large in proportion to the rest of the body.

Sheep Salve.—Mr. Stewart, in a letter on this subject, in the Highland Society of Scotland, observes, "That having got employment on the farm of Ballo, on the Lomond Hills, Fifeshire, power was given me to manage the sheep entirely after my own fashion, and I instantly set myself to consider what were the real objects to be gained by salving. They are twofold, first the destruction of vermin; and second, the growth of wool of superior quality. Now, it is clear that the more innocent the substance used, so much the better will it be for the sheep, as well as for the wool; for it is easy to see that tar, turpentine, tobacco juice, and arsenic, are all calculated merely to kill vermin, and cannot possibly be beneficial to wool, while the absorption of a portion of any of them, through the pores of the skin, cannot fail to hurt the animal more or less. Butter, therefore, appeared to be the only article that could benefit the wool without injuring the sheep. I then considered that oil, of the cheapest sort, used by itself, would serve the intended purpose; but as oil runs off easily by the heat of the sun, or even by that of the sheep themselves, it occurred to me to mix it with a portion of tallow, which being of nearly the same nature, would tend to harden the salve, so as to retain it. Feeling assured that I would get superior wool, I hoped also that it would prevent vermin on the sheep, but having some doubt on the propriety of leaving the tar entirely out, I mixed, in my first experiment, equal portions of tallow and train oil, weighing altogether 42 lbs., with 8 pints (16 quarts) of tar, for 160 hogs. I then smeared 400 with that sort of salve, and it proved much better than anything I had seen before, both for quantity and quality of wool; the vermin also being kept away. The wool-stapler said he never had a clip come through his hands equal to it. Encouraged by success, I next year left out the tar entirely, and smeared 400 hogs with tallow and oil alone, in the proportions given above, and I found that I had a still larger growth of wool, and of superior quality, so much so that it realised in the markets some shillings per stone more than the wool cured

by salves containing the tar, at the same time the advantage to the sheep was decidedly apparent.' From these results, Mr. Stewart's salve cannot be too much recommended; and as the season will soon be at hand, there will be plenty of opportunities to prove its value.—*J. M'Intosh.*

Newcastle Farmer.

COBOURG, CANADA WEST, AUGUST 1, 1848.

The next meeting of the Directors of the Northumberland Agricultural Society will be held at Grafton, on Wednesday, the 6th day of September next.

The Harvest has now fairly commenced; Rye, Barley and Wheat have fallen beneath the sickle and cradle scythe, and each promises a good return to the farmer. The Rye and Barley will doubtless be a good average crop, the Wheat will probably be above the average of the last seven years; the former will realize about the usual prices, neither being exportable produce will be all taken up for home consumption in the manufacture, chiefly of Beer and Whiskey, doubtless to the discomfiture of the tee-totallers, and it must be admitted, to a waste of the means of human sustenance, but it must at the same time be admitted that the sale of these articles produce the means of purchasing, *by the producers*, those exotic sustenating articles, which, from luxuries, have come to be necessaries, and Tea and Sugar take the place of those articles which may be made an article of export, and which alone yield a pecuniary return to the producer, and it must be conceded on all hands, that such pecuniary resources are, *to say the least of it*, occasionally needful.

The rigid moralist may say, why not grow only exportable articles? Alas! they are no farmers who put such a question. Why, there are thousands of acres in every section of the country only suited to the growth of these cereals, with any prospect of remuneration, for naturally of a description unfitted for the growth of wheat, too incohesive for that plant, and too dry for a permanent pasture, they could not be turned to account under any other crop; or, supposing them in grass either for Hay or Pasture, where can there be found a remunerating employment. Hay, with half an English crop and less than half an English price, and a market soon glutted, added to which, labor at an exorbitant rate, would leave the farmer at a nonplus, with all his capital, skill and labor thrown away, or only expended in support of unremunerative labor. Nor would grazing turn to any better account while the supply of provisions to a limited population so far exceeds the demand. The inhabitants of the Towns and Villages at this time have both Beef and Mutton of a much superior quality to that furnished some 15 years since; this by the improvements in agriculture, and the care, skill and increased expenditure of the farmer, who does not receive one farthing per pound extra on the animals furnished to the butcher.

We expect to hear that the Wheat market, by the Merchants and Millers, will open at about three shillings and sixpence per bushel, the advices from all the Wheat growing countries in the world concur in stating the prospect of an abundant crop, and the potato crop having favourably progressed, the demand for Grain will be less and cause the prices to rule low. Ireland will need no supplies and England be as nearly independent of foreign grain as at any former time, and her supplies, if drawn from Canada, with the present rates of freight and charges, must be at a loss either to the speculator or producer. What the proposed alteration in the Navigation Laws may effect in this matter we know not, we fear but little while our river and internal freight and charges remain unaltered. Looking on the subject as the breaking up of a monopoly and throwing the trade open to a fair competition, which competition all the producers of the freight are subject to, we should say, may it take place, but considering the question irrespective of this, we consider it the most hazardous of all hazardous experiments hitherto adopted by any Ministry of Great Britain.

The late seasonable showers have been of great benefit to the root crops, which, from the long drought were promising but badly. Turnips and Potatoes will now get a start to ensure a crop, should disease not make its appearance; Carrots seem to have failed in many instances, we have lost one sowing entirely, whether from bad or old seed, or from insect depredation cannot say, we sowed a second time, but the plants are very scarce and not above two inches high at this time; too backward to come to a crop.

Can any of our readers inform us whether there is any connection between the small black lice found at the extremities of the branches of the Cherry trees this season, and the slug which is now devouring the leaf with such fearful rapidity; and whether any means can be adopted for their destruction? We have tried the smoke of Tobacco, the dusting the trees with Plaster and Lime but without effect.

DYSENTERY IN SHEEP.

Dysentery consists in inflammation, of a somewhat peculiar nature, of the mucous lining of the intestines, attended, in an early stage, by an increased quantity of the natural secretion, and, as the disease advances, of a morbed alteration of that secretion, as well as a frequent discharge of it.

It may also be a concomitant of other diseases; for instance, it is not unfrequently the destructive accompaniment of phthisis in the lower animals; while the human surgeon looks upon it as one of the very worst attendants upon pulmonary consumption in his patients. I have, likewise, frequently found chronic hoose degenerate into it. Its causes, however, may be commonly and clearly traced, exclusive of its origin in, or connection with other diseases.

Causes.—The animal may eat that which is unwholesome mingled with its food, or he may drink water that is insalubrious. Under accidental circumstances he may also lick, and swallow with his saliva, matters of a contaminating or morbific nature, and by any of these means he may lay the foundation of dysentary.

Within the alimentary canal is elaborated the chyle. The chyle forms the blood, and the blood nourishes and repairs every part of the frame; while the formation of both of these

depend upon the food. Different pastures have also different degrees of nutriment or unwholesome properties, arising not only from baneful plants that may be growing among the esculent herbage, but from the quality of the grass itself. I have frequently seen this disease produced when a flock has been driven from soft and succulent food to that which was drier and harder. Then the manyplus, or third division of the stomach, which had been for a considerable time employed in pressing out the juice that is easily extracted, and comminuting that which gives little resistence, is all at once called upon to perform a severe duty, and we need not wonder that its energies soon become exhausted and paralyzed; and thus the food, being permitted to pass into the intestines without due comminution its fibres are left, which keep up a continued irritation of the internal mucous lining. On the other hand a sudden change from dry and bare pasture to one that is covered with soft and succulent food will, in another way, produce the same effect.

A transition of situations will also undoubtedly lay the foundation of this disease.

After an animal has been habituated to a dry, warm soil for a long period, and is then removed to a cold, damp and exposed one, it is not surprising that the natural functions of the digestive organs become impaired, or the organs themselves debilitated and diseased. This may be satisfactorily explained in another way:—the body rendered irritable by the previous heat, which has freely opened the exhalent vessels of the skin, and being exposed suddenly to much cold and moisture, the blood is thereby thrown from the exterior vessels into the interior, and thus dysentery is engendered. In a similar manner we may account for its resulting from violent exertion, or suddenly checked respiration. I may say with confidence, that I have frequently witnessed the operation of this latter cause in the sheep; and I trust I shall not be considered as digressing from the ordinary rules of this society if I relate a circumstance which fell under my notice a few years ago, for it has been said with much truth that sometimes a trifling circumstance, well marked and reasoned upon, establishes an important principle.

A flock of fat sheep had been purchased by a farmer at a considerable distance from his home, were being driven to their new master, when they were overtaken by a heavy storm, accompanied by a cold, piercing wind. The boys who were driving the poor animals, of course, took shelter, whilst the sheep were left shivering in the open air. About an hour afterwards they were examined by their new owner, and, much to his surprise, he found them panting and foaming at the mouth. The next morning they appeared dull and languid, and had ceased to ruminate, and at noon, on the same day, half of the flock had, to use the words of my friend, "got the flux." Gruel and ginger were given them for several days, and they recovered; but I have no doubt had the diarrhœa been allowed to have gone on, it would eventually have terminated in dysentery.

One other cause remains to be noticed, and that is very seldom taken into account—it is metastasis of fever, or rather its translation from the seat which it first occupied to the intestines. This I am induced to believe is a more frequent cause than is generally imagined. I need scarcely add, that another and very common cause of dysentery is neglected or maltreated diarrhœa.

Symptoms.—This being essentially an inflammatory disease, the general symptoms of fever will invariably be found. The animal appears dull, he lies down frequently and rises again. After a short interval the conjunctival lining of the eye-lids is injected, and the nostrils and mouth are hot and dry—the respiration is slightly disturbed, and the pulse quick and wiry—the wool is drier than natural, and easily removed from the animal. The appearances, however, which point out the true nature and seat of the disease are to be found in the evacuations, which consist of blood and mucous, mixed with small and extremely hard portions of fæcal matter. These constitute the scybalæ spoken of by medical men who have written on this scourge of the human being. These scybalæ and other fæcal matters are voided frequently, and their smell is peculiarly offensive. As the disease advances, the fœtor increases; and at each evacuation the animal, by alternately holding up its hind legs, too plainly shows how painful the operation is to him. Debility quickly supervenes, if the poor creature is not relieved; and he either lingers for weeks a living skeleton, or the symptoms rapidly increase in violence, and their prevalence for a day or two is sufficient for his destruction.

From this account, it might be thought that no one could possibly mistake the disease; yet, strange to say, there are many individuals who confound it with diarrhœa, which is merely an increased flow of the natural secretions of the intestines, by which the egesta is rendered semi-fluid. They are readily distinguished even by a common-place observer, if he only exercise a moment's thought. I may also observe that, while diarrhœa affects chiefly the small intestines, dysentery is principally confined to the colon and rectum.

(*To be continued.*)

MILK OF DIFFERENT ANIMALS.

As far as we know, no nation uses the milk of any carnivorous animal. There is no reason for believing that the milk of this order of animals would be either disagreeable or unwholesome; but the ferocity and restlessness of the creatures will always present an obstacle to the experiment. The different milks of those animals with which we are acquainted agree in their chemical qualities, and this is confirmed by the fact, that other animals besides man can be nourished in infancy by the milk of very distinct species. Rats and leverets have been suckled by cats, fawns by ewes, foals by goats, and man, in all stages of his existence, has been nourished by the milk of various animals, except carnivorous. The milk of the mare is inferior in oily matter to that of the cow, but is said to contain more sugar and other salts. The milk of the ewe is as rich as that of the cow in oil, but contains less sugar than that of other animals. Cheese made of ewe milk is still made in England and Scotland, but it is gradually being disused. The milk of the ass approaches that of human milk in several of its qualities. To this resemblance it owes its use by invalids in pulmonary complaints, but it has no particular virtue to recommend its preference, and is only prescribed by nurses. Goat's milk, perhaps, stands next to that of the cow in its qualities; it is much used in southern Europe. It affords excellent cheese and butter, its cream being rich, and more copious than that from cows. Camel's milk is employed in China, Africa, and, in short, in all those countries where the animal flourishes. It is, however, poor in every respect, but still, being milk, it is invaluable where butter is not to be procured. The milk of the sow resembles that of the cow, and is used at Canton and other parts of China. The milk of the buffalo is also like that of the cow, though the two animals belong to different species. Every preparation of milk, and every separate ingredient of it is wholesome. Milk, cream, butter, cheese, fresh curds, whey, skimmed milk, butter-milk, &c., &c. Butter-milk and whey will undergo a spontaneous vinous fermentation, if kept long enough, and alcohol can be distilled from it. The Tartars it is well known, prepare large quantities of spirituous drink from mare's milk.—*Farmers' Journal.*

THEORY OF DRAINING.

It is now established that land requiring draining and subsoiling, neither produces so early nor so abundant a crop as the same soil drained and deeply pulverized or broken up, but, on the contrary, like a cold wet spring, it retards the growth of plants. To prove this fact to the understanding of all, take two thermometers which correspond in measuring heat, let the bulb of one of them be covered with a bit of wet linen rag, and then both hung up together, equally exposed to the open air, when it will be at once seen that the one covered with the wet cloth will sink VERY MANY degrees below the other, and this will be the case as long as the bit of rag is kept wet, the

evaporation from which creates a reduction of heat. The capiliary attraction of the surface of the earth enables it to part with its moisture (from below) to the air in precisely the same way as the wetted rag, and hence the cause of the late season and inferior crops in cold, wet, spring weather, or on wet, retentive land, and hence the utillity of draining, and sub-soiling to permit the free percolation of the rain water, loaded with its fructifying gasses from the surface to the roots of plants, in place of being retained on the top portion of the soil to perish its vegetation. That the air is a dry body and has an affinity to moisture, is proved by a constant fall of rain from time to time, and as we may each notice in our own person, from the evaporation of the insensible perspiration from the surface of the body, and from its being the cause of producing cold, and which we notice when there is a breeze, by saying that it is a sharp day, &c.; and this may be also proved by hanging a thermometer between two doors, where there is a strong current of air, and placing another out of the current, but both without any thing on the bulb, it will at once be seen that NO CHANGE will take place in either thermometer; but if the wetted rag be again applied the temperature will again show the reduction of the mercury.—*Correspondence Farmers' Gaz.*

TO DESTROY INSECTS.

SIR—Your Roscrea correspondent in his query wishes to be informed how the ravages of the fly may be checked on the turnip, and a "Milltown Subscriber" to destroy insects on rose trees. I would say to both, kill them, by boring the heart of a large cabbage stalk, fill the same with flax-tow, brimstone, and cut tobacco; fasten the stalk on the pipe of a common bellows; walk up the turnip-drill and blow gently; if shrubs or fruit trees, direct the smoke through the leaves and branches. The steam of the cabbage-stalk and smoke of brimstone and tobacco will kill all flies, bees, or insects, nor will flies of passage stop long on the leaves when the taste of brimstone and tobacco is on the plants.—Yours, &c. P. J. *Carrick-on-Shannon, June* 9, 1848.

ACCLIMATIZING.

Acclimatization, as it has been properly called, has occupied the attention of many persons, who have fancied they had accomplished a great purpose when they had kept, perhaps, a half hardy plant out of doors all the winter, and concluded they had altered its constitution. Now, there are many ways of deceiving ourselves in these matters; and some have so completely done this as to write long treatises on the acclimatization of plants, which have gone off almost as soon as the treatise, or the more humble paper, has been read. It will be our business to show, in the course of this work, that no such feat is to be accomplished. A place may, though out of doors, be so much warmer than the rest of the garden, or than the open air generally, that a plant not perfectly hardy may exist when frost takes off many less warmly situated. But this plant is not acclimatized! It is as tender as ever it was, it is only more sheltered than its less fortunate neighbours and not more hardy. There is not a greater fallacy in the whole art of gardening than the supposed power of altering the constitution of a plant. A plant under some circumstances will bear more cold than under other circumstances, this cannot be questioned, for instance, if the wood is ripe, some plants will bear very hard frost; but, if it be not ripe, the frost will kill back the unripe wood; and this is so well known, that we can point out instances among our ordinary trees. Let us take one, the walnut; if, after this has fairly begun growing, a sharp frost sets in, every leaf, and the shoots they are upon, will turn as black as the fruit is when pickled; and away has gone, in all probability, the crop for the season. In the number of years which a walnut tree may have succeeded without once being touched by frost, the tree has not been more hardy, but the frost less severe, or perhaps there has been none.

A rhododendron campanulatum, said by Messrs. Loddiges to have been hardy, was growing fast in a pit, and removed into the open air in the spring, but a very slight frost killed back all the new shoots, whilst its companion, which had been out all the winter, had not begun to grow, and was untouched by the cold. A celebrated writer, whom it was once considered ought to have known better, gave a long list of directions for acclimatizing plants, and the world, at least the gardening world, went to work; but nothing could be more unfortunate, When all is done that can be done, the plant will not bear half a degree more frost than when nothing is done. Whatever will raise the temperature of any particular spot is one thing; but when the plant which will live there is taken to stand its chance among the winds and wets of the season, away goes the acclimatizing of seven years. Our business will be to prevent such errors, and to show that there is no hardening the constitution of plants. Let us, however, proceed from explaining the fallacy of these erroneous notions, to show what may be done and what has been done. By saving seed, from time to time, plants of more rubust constitution *may* be produced. We have proofs of it, to some trifling extent; and probably, had pains been taken, it might have been carried much further. It is clear that some potatoes will bear more cold than others without damage, but not much. Now, as there is evidently a little difference, there might have been more; and therefore, were seed constantly saved, and as constantly noticed with regard to the capacity of bearing cold, much more might have been done. The difference hitherto has been too trifling to mention otherwise than as a fact palpable, but not sufficiently conspicuous to be useful.

To be continued.

AN AUSTRALIAN NATIVE VISIT.—My two companions having gone, I was now left alone in possession of the unfinished hut. On the second day, about sunset, I was by no means agreeably surprised by a visit from about a dozen natives, the most villanous specimens of humanity that ever came within my limited observation. They marched right in, and surrounded me, their countenances glowing with the most ferocious aspects. Presently, one commenced, as the spokesman of the rest: "Give me bread," said he, in a loud voice; and "bread, bread!" they shouted simultaneously; one grinning with a hideously menacing look, shaking his waddy, and coming close to me said, drawling it out, "B-r-e-a-d!" "Well, then, you must bring me plenty of wood," said I. They laughed in derision. They then commenced an agreeable and elegant dance round me, which I had a full opportunity of admiring, though I must say admiration was very far from being the prevailing emotion of my mind, especially as I caught a glimpse outside of the circle of two diabolical little picanninies grinning away to one another at the fun, and saying, "Ha, ha! eh, eh! plenty kill um white fellow by-and-by." An indistinct vision of being roasted and eaten stole through my mind. But suddenly they stopped, and in a quieter tone again demanded bread, which I gave them, and after some further trouble I succeeded in getting rid of them. —*A Visit to the Antipodes.*

AUSTRALIAN SNAKES.—Considering the great number of snakes in all parts of the bush, it is quite astonishing so few persons meet their death by them. My own escapes have been almost innumerable, and so I suppose have been most other bushmen's. Now and then one hears of some very melancholy case of fatal effects. I do not know whether naturalists have collected specimens of all the species to be found in this country; but when collected they must form a singularly striking and disgusting spectacle. I have seen a snake which seemed full grown not more than eight inches long, and about the thickness of a stout tobacco-pipe, of the most glittering silver grey, and a head like an oblong bead flattened. Then again, there is that genus of the diamond snake which frequents the water, running to extreme length: on Paramatta bridge, some years ago, one was found 27 ft. long. Between these range the black snake, which runs from three to seven feet, and whose bite is deadly; the brown snake, commonly found from three to four feet, and said to be more venomous than the black; the copper-coloured snake, a very long, thin, and beautifully coppered species, whether venomous or not in a high degree I cannot say; it is not very common. I saw

no more than two of them in the whole period of my residence. Besides these there are grey, green, yellow, and carpet snakes; indeed, you scarcely pass a summer without seeing several new sorts. The reader perhaps will feel it difficult of belief, but I certainly should not withhold the fact, that I have known settlers plough up as many snakes in ploughing ten acres of ground as would fill a peck measure; and I was once shown a track of bush road by a fellow traveller, in travelling along which some time previously he assured me he had seen upwards of twenty snakes of various species.—*Settlers and Convicts, by an Emigrant.*

Butter Making.—If I want butter only for my own breakfast, I lay a sheet of blotting paper upon a plate and pour the cream upon it. In a short time the milk filters through and the butter is formed. If I wish to expedite the operation, I turn the paper over gently upon the cream, and keep it in contact for a few moments, and then press upon it, and the butter is formed in less than two minutes. If you submit it to a severe pressure by a screw-press, it becomes as hard as when frozen. I cannot think but the simplicity of this mode of proceeding would be universally adopted if any better material than blotting-paper could be thought of for the filter—the paper adhering too firmly to the butter, and the finest muslin admitting the passage of the cream.—T. *H., Stoke Newington.*

Sweetening Butter.—A correspondent of the 'Mechanics' says—, whilst lately engaged making some experiments, it occured to me that butter, either fresh or salt, possessing a disagreeable effluvium and flavour might be rendered perfectly sweet, by the addition of a little carbonate of soda. On trial, it proved correct. The proportion is two drachms and a-half of carbonate of soda to three lbs. of butter. In making fresh butter, the soda is to be added after all the milk is worked out, and it is ready for making up. The unpleasant smell is produced by an acid, which being neutralised by the alkali, disperses at the same time the disagreeable flavour. This acid is generated by peculiarities in the constitutions of some cows, by the condition of certain fodders, by the length of time the cream is kept before churned, but too often by the dairy utensils not being kept thoroughly clean.—*Farmers' Journal.*

Taste of Turnips in Butter.—The method I have pursued here of feeding milch cows with turnips and hay, without the milk or butter being in the least degree tainted with the taste of turnips, has been so successful, and is so very simple, that I am induced to send you a statement of it for insertion in the journal, in the hope that it may be useful to some of your readers. About six or seven years ago, I saw it stated in a provincial newspaper, that to feed cows with turnips immediately after being milked, and on no account to give any shortly before milking, prevented the milk from tasting of the turnips. I adopted the hint, and ever since then there has been no occasion to complain of the milk or butter tasting of turnips. The method I pursued is; immediately after being milked in the morning, they get as many turnips as they can eat; if any are left in their troughs they are taken out. During the day they are fed on hay, and immediately after milking at night they get the same quantity of turnips. The milk and butter are very much admired by all who take them, both for colour and flavour, and I have often been called upon to give a statement of our system of feeding by visitors. I have several times given the cows turnips a short time before being milked just to prove the thing. On such occasions the milk and butter tasted strongly of turnips.—*George Smith, in Gardeners' Chronicle.*

Method of Preventing the Attacks of Caterpillars.—At this season of the year, when caterpillars generally attack fruit trees and bushes, the following method of preventing their attacks, may not prove undeserving of notice. Let a hole be boared in the stem of the tree, as far as the heart, in a direction sloping downwards, about a foot from the surface of the ground. Into this hole pour a little mercury. Close up the hole with a peg not very tightly fitted in. Cut the top of the peg smooth with the bark of the tree or bush, and then put a little tar over it to prevent water getting into the hole. This I have found, says Mr. Brown, of Pinfield, near Elgin a safe and sure method of not only preventing the attack of caterpillars, but of driving them off the tree; and it is not yet, I believe, publicly known.

Treat Horses Well.—In France every horse in a cart carries wood enough in his collar to make his stable door, with a sufficiency of wool on his back for a couple of useful rugs, his driver at the same time either calling him a "thief" or a "brigand," or beating him unmercifully. In Sweden, the very horses in a coal cart might serve to take a marchioness to a drawing room, so sleek and high bred are the fine Holstein animals without exception; having plain, black, scanty harness, without either blinkers or breechens, apparently docility itself—a sure proof of the affectionate treatment it is so excessively pleasing to know they receive.—*From Rambles in Sweden and Gotland.*

How to make Vinegar from Milk.—The cowherds on the Alps, and several parts of France, use milk whey to make the sharpest vinegar. The process is very simple. After having clarified the whey, it is poured into a cask, with some aromatic plants, or elder blossoms, as it suits the fancy, and exposed to the open air to the sun, where it soon acquires an uncommon degree of acidity.

Sale of the late Earl Spencer's Breed of Shorthorns.—The second sale of short-horned cattle, from the breed of the late Earl Spencer, and bequeathed by his lordship to Mr. John Hall, of Wiseton, in Yorkshire, took place at the farm on Friday last, and was attended by several hundreds of persons, including some of the first breeders in the kingdom. It is well-known that this fine herd of cattle is not surpassed by any in the kingdom, nor is it perhaps too much to say, that a finer or purer breed of cattle could not be found anywhere. Mr. Wetherall, of Durham, was the auctioneer, and commenced proceedings about half-past two in the afternoon. There were seventy-five cows and heifers, the first of which was knocked down for a hundred and fifty guineas.—This was a red cow, Gold, by Orontes, five years old. It was purchased by the auctioneer. Several of these were purchased by Sir Thomas Cartwright, of Northamptonshire, who was present at the sale, and who gave 180 guineas for Tulleria, a beautiful red and white cow by Orontes, three years old.—Volage, a cow by Zenith, was purchased for Lord Ducie, the price being 200 guineas, and some at a lower price were purchased for Lords Burliton and Dufferin, the Hon. Mr. Pelham, Lord Harewood, &c. The whole sum realized for the cows and heifers was 4.100 guineas. The first bull put up, was that famous animal Usurer, by the Lord Warden, which was purchased for Lord Ducie, at the price of 400 guineas. Upstart, by Lamplighter, was sold to Sir Thomas Cartwright for 200 guineas; and a little bull calf, only two months old, fetched 52 guineas. The sale of the bulls realized 1,304 guineas, making a total of 5,404 guineas for the herd.

Scotch Agriculture.—At the beginning of the last century Scotch agriculture was in the most depressed state; the tenants were destitute alike of capital and skill, green crops were almost unknown, and the quantity of wheat that was raised was quite inconsiderable. A field of eight acres sown with grain near Edinburgh, in 1727, was reckoned so great a curiosity, that it excited the attention of the whole neighbourhood; and even so late as the American war, the wheat raised in the Lothians and Berwickshire did not exceed a third of what now grows in them; and taking the whole country at an average, it will be below the actual cereal estimate, when we say that the cultivation of wheat has increased tenfold since the year 1780. At that period no loaf bread was to be met with in the country places and villages of Scotland, oat cakes and barley bannocks being universally made use of. But at present, 1848, the case is widely different. There is hardly a village to be met with, however small, that has not a public baker.

Miscellaneous.

HONOUR TO THE TOILING HAND.

BY J. DARK.

All honour to the toiling hand,
Or in the field or mine;
Or by the hissing steam machine,
Or on the heaving brine.
Whatever loom, or barque, or plough,
Hath wrought to bless our land;
Or wrought around, above, below,
We owe the toiling hand.
Then honour—honour to the toiling hand.

In battles with the elements,
It breaks the stubborn sward;
It rings the forge,—the shuttle throws,—
And shapes the social board.
It conquers clime,—it stems the wave,—
And bears from every strand
The sweetest, best of all we have,
Gifts of the toiling hand.
Then honour—honour to the toiling hand.

THE BACK OF THE HORSE.—If a horse's back is unusually *long or short*, which are the peculiar advantages of either case?—A BREEDER. The following appears on this subject, in the volume entitled "The Horse:"—"The comparative advantages of a long or short carcass depends entirely on the use for which a horse is intended. For general purposes the horse with a short carcass is properly preferred. He will possess health and strength; for horses of this make are proverbially hardy. He will have sufficient ease not to fatigue the rider, and speed for every ordinary purpose. Length of back will always be desirable when there is more than usual substance generally, and particularly when the loins are wide, and the muscles of the loins large and swelling. The two requisites, strength and speed, will then probably be united. The back should be depressed a little immediately behind the withers; and then continue in an almost straight line to the loins. This is the form most consistent with beauty and strength. Some horses have a very considerable hollow behind the withers. They are said to be *saddle-backed*. It seems as if a depression were purposely made for the saddle. Such horses are evidently easy goers, for this curve inwards must necessarily increase the play of the joints of the back; but in the same proportion they must be weak and liable to sprain. To the general appearance of the horse, this defect is not in any degree injurious; for the hollow of the back is uniformly accompanied with a beautifully curved crest. A few horses have the curve outward. They are said to be *roach-backed*, from the supposed resemblance to the arched back of the roach. This is a serious defect; altogether incompatible with beauty, and materially diminishing the usefulness of the animal. It is almost impossible to prevent the saddle from being thrown on the shoulders, or the back from being galled; the elasticity of the spine is destroyed; the rump is badly set on; the hinder legs is too much under the animal; he is constantly overreaching himself, and his head is carried awkwardly low.

CHANGE OF FOOD NECESSARY FOR ANIMALS.—"Why is not an acre of clover considered equal in fattening value to an acre of mixed meadow grass?—EAST KENT."—We presume that our correspondent means weight for weight. According to Dr. K. Thompson, the difference exists in the fact of the grass offering more varied food than the clover. He says, in his recent book on the fattening of animals:—"Not only, however, is *variety* of food requisite for an animal in an artificial state, it is found also to be beneficial to one in a condition more akin to that of nature. For it is upon this principle that we are able to account for the superior influence of old natural pastures, which consist of a variety of grasses and other plants, over those pastures which are formed of only one grass, in the production of fat cattle and good milk cows. To any one who considers with attention the experiments which have been detailed, there cannot remain a doubt in the mind that cattle, and especially milk cows, in a state of confinement, would be benefited by a very frequent and entire change in their food. It might not be too much to say that a daily modification in the diatary of such animals would be a sound scientific prescription. In considering the case of the white cow we find, that a change from barley to barley and molasses increased the milk in three days from 21lbs. 6oz. to 23lbs. 7oz.; on changing from malt to barley it increased from 19lbs. 10oz. to 20lbs. 11oz. on the first day; from barley to barley and linseed, it increased from 21lbs. 2oz. to 23lbs. 12oz. on the sixth day; from barley and linseed to beans, it increased on the first day from 21lbs. 13oz. to 23lbs. 14oz.

THE VALUE OF WORMS.—"I am much annoyed by worm casts on a lawn that I have the care of; and am recommended to destroy them by a solution of corrosive sublimate. We are told that every living creature as its use. I shall feel obliged therefore if you can point out to me the use of the earth worm. A GARDENER." Mr. Josiah Parkes, the agricultural engineer, thus describes the value of worms, as assistants in draining:—"Earth worms love moist but not wet soils; they will bore down to, but not into water; they multiply rapidly in land after drainage, and prefer a deeply dried soil. On examining with Mr. Thomas Hammond, of Penshurst, Kent, part of a field which he had deeply drained, after long previous shallow drainage, we found that the worms had greatly increased in number, and that their bores extended quite to the level of the pipes. Many worm bores are large enough to receive the little finger, and it is probable that one worm has several bores for his family and refuge holes from rain. I have very recently found worms twisted up into knots, and berthed in a nidus formed by the side of the vertical bore, and in communication with it by a lateral hole about an inch long, forming in appearance a comfortable retreat. My valued and much lamented friend, Mr. Henry Handley, informed me of a piece of land near the sea, in Lincolnshire, over which the sea had broken, and killed all the worms—the field remained sterile until the worms again inhabited it. He also showed me a piece of pasture land near to his house in which worms were in such number that he thought their casts interfered too much with its produce, which induced him to have it rolled at night in order to destroy the worms. The result was that the fertility of the field greatly declined, nor was it restored until they had recruited their numbers, which was aided by collecting and transporting multitudes of worms from the fields. The great depth into which worms will bore, and from which they push up fine fertile soil, and cast it on the surface, has been admirably traced by Mr. C. Darwin, of Down, Kent, who has shown that, in a few years, they have actually elevated the surface of fields by a layer of fine mould several inches thick, thus adding to the pabulum of grasses."

CURING HAMS.—Much has been written on preserving Hams. The following excellent mode of protecting them from flies, I do not remember of ever seeing noticed: and perhaps may not be generally known to the readers of your valuable paper.

It is simply this:—*Let the last application of smoke be made with sulphur.* Although the amount applied be not sufficient to effect their flavor; yet such is its efficacy, that no other system of defence against the mischievous attacks of flies will be required, until midsummer at least, (experimentally speaking,) and even those newly cut, will remain undisturbed. The same treatment is beneficial in the case of cheese.

W. HANFORD, JR.

—*Genesee Farmer.*

A Dutchman once wanted to wed a widow, and his manner of making known his intention was as follows:—"If you is content to get a better for a worse, to be happy for a miserable, and if you smokes and drinks ale, I shall take you for no better, and much worse." Upon which the lady said "Yaw."

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