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NEWCASTLE FARMER.

VOL. III.—NO. IV. COBOURG, DECEMBER 1, 1848. THOS. PAGE,—Editor.

BLIGHTS OF THE WHEAT.

CHAPTER X.—CONCLUDED.

But it is impossible to conceive that infinite wisdom, and power, and goodness, can give vitality to such atoms without a direct and a beneficial design. Science has, indeed, recently had its reward in discovering such a design in the infusorial animalcules in their living state. "A wise arrangement of nature," says Liebeg, "has assigned to the infusoria the dead bodies of higher orders of beings for their nourishment; and has in these animalculæ created a means of limiting to the shortest possible period, the deleterious influences which the products of dissolution and decay exercise upon the life of the higher classes of animals. The recent discoveries which have been made respecting these creatures are so extraordinary and so admirable, that they deserve to be made universally known." The principal fact in these discoveries is, that the functions of animal nature are reversed in these animalcules, and that instead of evolving carbonic acid gas, they evolve pure oxygen. Count Rumford made a similar discovery many years ago; but it was, like numerous other good facts, totally buried in oblivion. The air bubbles given out by water containing these animalcules contain such pure oxygen, that a small bit of deal match-wood, in which a flame has just been extinguished, will burst into a flame again on being immersed in any one of them. "I myself," the celebrated German chemist last named tells us, "took an opportunity of verifying this remarkable fact, upon finding in a trough of water in my garden the fluid coloured green by the presence of various species of infusoria. I filtered it through a very fine sieve, in order to separate all confervæ, or vegetable matters; and then exposed it to the light of the sun in an inverted beaker-glass, completely full, the aperture of which was confined by water. After the lapse of a fortnight, more than thirty cubic inches of gas had collected in the glass, which proved to be very rich in oxygen." Here, then, we have actually in these creatures, unsuspected and unseen till the microscope revealed them, a source of pure vital air. From the instant, therefore, that these infusoria appear in stagnant water impregnated with deleterious matter, that water ceases to act injuriously on the higher orders of plants and animals. To quote Liebeg once more; "In the most extensively diffused animalculæ, namely, the green and red infusoria, we recognise a most admirable cause which removes from water all substances injurious to the life of the higher classes of animals; and creates in their place nutritive matters for the sustenance of plants, and the oxygen indispensable to the respiration of animals." Again, he observes, "The infusorial animalculæ cannot be the causes of putrefaction—of the production of poisonous matter deleterious to plants and animals—but an infinitely wise intention designs them to accelerate the transition of the elements of putrefying substances into their ultimate products." The reason of their presence in these places as regards themselves obviously is, that in them they find the conditions suitable for their development and sustenance. When these circumstances take place, the universal presence of the atmosphere through which their eggs are diffused, causes them to make their appearance wherever the requisite state of things for their vivification exists. They are, however, subject to the injurious influences of actual putrefaction, and are killed by the sulphuretted hydrogen gas evolved during that process. They abound in all decaying substances, but never in really putrid masses. Their province therefore, evidently, is that mentioned by Liebig, to hasten on decay, and limit the health-destroying influences of putrescent matters.

If a globule of water in which they are found is placed on a slip of glass under a microscope, they will, as has been said, be seen swimming about in it with extreme vivacity. Just take the least drop of sulphuric acid on some fine point, of a hair, or a pin, or a feather, and touch the water. They die instantaneously, as if suddenly shot. Nothing can be conceived more momentary than this effect.

The contemplation of such subjects must ultimately produce great changes in the process of man's thoughts. How often have we been disgusted in looking upon the red and green colouring matter of some pond or ditch, and regarded it as a nuisance. This view was, like many others in which we indulge, far from the truth. Instead of being what our imagination misrepresented to us, it was a world of beautiful and useful creatures performing unseen the great purposes of God, and actually conferring benefits on us who were regarding them in a wrong light. The remembrance of the errors of ignorance ought to humble us; and while nature is daily opening the treasures of her hidden marvels, we ought to learn that revelation can unfold greater marvels, still, to rebuke our trust in feeble sense, and quicken our faith. It is hoped that the remarks in this chapter on the fungi and insects that may be regarded as the congeners of those it was the chief object to describe, will give an increased interest to the details before given. They may tend also to the good of the agricultural reader, by God's blessing, in more ways than in pointing out certain mundane evils and their remedies. It is desired that they beget in his mind many considerations to which, perchance, he may heretofore have been a stranger. Lessons of piety are not only written in the gospel, but those lessons we find there, are enforced by a right knowledge of nature. The natural and moral perfections of God are in perfect unison; and we may be certain, that as science advances in Christian lands, its discoveries will help to close the lips of the sceptic, and the true light brightening at the same time, "wisdom and knowledge" will indeed become both the "stability of our times, and the strength of our salvation."

In order, however, that this happy result may accrue, it is necessary not merely that we should view nature in the great and the small, with admiration of the power and wisdom of the Creator, but that we should see physical truth through a spiritual medium. Ages past, the heathen poet could say of the great Supreme Cause, "In him we live, and move, and have our being." In the same manner we may say now with our own—

> "Hail, Source of Being! Universal Soul
> Of heaven and earth! Essential Presence, hail!
> To thee I bend the knee: to thee my thoughts
> Continual climb: who, with a master hand,
> Hast the great whole into perfection touched.
> By thee the various vegetative tribes,
> Wrapt in a filmy net, and clad with leaves,
> Draw the live ether, and imbibe the dew.
> By thee dispersed into congenial soils,
> Stands each attractive plant, and sucks, and swells,
> The juicy tide; a twining mass of tubes.
> At thy command the vernal sun awakes
> The torpid sap, detruded to the root
> By wintry winds; that now in fluent dance,
> And lively fermentation, mounting, spreads
> All the innumerous coloured scene of things."

This is all true, and beautifully expressed; but more is required. And as the present mixed state of the world is unquestionably declared in Scripture to be due to the fall of its

principal inhabitant, so everything natural, to be profitably regarded, must be referred more or less to the moral condition of man in this world. We shall then find nature and religion helpful to each other. The religion of Christ is the only rectifier of that which is wrong in nature; and nature in her turn, by her analogies, strengthens man's faith in religion. Our Lord himself in his ministry taught much by natural similitudes, and has hereby left his servants a pattern that they shou'd more largely follow. If the thorn, and the brier, and the various impediments to the earth's bringing forth the needful sustenance for man, have succeeded the curse, then it is but reasonable that our studies of these disorders of the original beauty of creation should be made with the aid of revelation. It is true that the gospel was not designed to teach us physical science, but it was intended to explain and rectify our condition, and to unfold to us the relation wherein we stand to God, both for time and eternity. But considering that the effects of this our state prevail all over nature, and will be the ultimate cause of the destruction of the world, it is quite clear that the Scriptures, though not teachers of science, must be the regulators of those who pursue it aright. "The wisdom of this world," arising out of the mere exercise of our rational faculties, is plainly asserted to be "foolishness with God."

"Truths that the learn'd pursue with eager thought,
Are not important always, as dear bought,
Proving at last, though not in pompous strains,
A childish waste of philosophic pains.
But truths, on which depend our main concern,
That 'tis our shame and misery not to learn,
Shine by the side of every path we tread
With such a lustre, he that runs may read."

Without some allusions to the causes which involved the world in its present anomalies, all things around us are a mystery. Viewed through the gospel, they are seen to be parts of a peculiar whole, and the reason is explained; while both in the evils which attend our minds, and those which spread over the face of all things, we may perceive the same mixture of justice, mercy, and instruction. Not one of the minute consumers of our food which have been adverted to in these pages will, thus regarded, fail to teach us some lesson. The very atmosphere we breathe has been shown to be pregnant with the germs of these little pests; and yet tried as we are by them, they all perform some compensating function, which shows that in the very midst of judgments there is in heaven a remembrance of mercy. Is not this what revelation teaches us in a higher degree? And do we not see an analogy in the universal diffusion of these atoms, having life and giving birth to living things that prey on that which we regard most valuable, to the whole state of the moral atmosphere around us, whence sins of all kinds enter the heart upon the wings of every thought? Look again at the mistakes made respecting these pests. How continually have they been misconstrued; and let us remember how little man knows without the gospel, of the real character of the miseries which beset him in this life. It has been mentioned that certain cultivators of the soil have regarded some of their little foes as a favourable sign, accompanying a good yield of a valuable produce. How many are continually making similar errors with regard to the destroyers of that which is for their highest interest. Multitudes of people look upon certain irregularities in youth, for instance, as signs of what they call a good heart, a free disposition, a manly generous spirit; and believe them to be compatible with an abundant exhibition, in after life, of virtues of various kinds. But they forget that they are really destructive of all that fits the heart for the knowledge of God, and true preparation for his presence hereafter. Again, we have shown how constantly men have attributed to the destroyers of certain insects, the very evils caused by these little depredators to which they are the antidotes. This has been done in ignorance, and knowledge has shown the error. Now, how constantly do we find persons attributing to the very individuals who are aiding by their counsels, their prayers, and examples in warding off evils the actual evils themselves. All sorts of misrepresentations of Christian agency, every species of opprobrious epithet, all kinds of denunciations have been levelled against those whose occupation is in presenting the only genuine antagonism to the spread of all that would overrun and destroy the best blessings of man. Blind prejudice has constantly accused such philanthropists of causing the maladies to which, under God, they are the only effectual check. Perhaps some persons who have indulged in such mistaken views, may learn from these observations to make more assiduous inquiries, and to seek for light and knowledge. "There is a way that seemeth right unto a man, but the end thereof are the ways of death."

Many more instructive analogies might be adduced. We may recollect that not a single devastator of our bread-corn; not a single insect to which attention has been called; not a fungus that preys upon and accelerates the decay of the most useful plants, but in its nature has a tendency to remove, as well as to inflict, some evil. We have seen how it is their province to hasten decay, limit putrefaction, and thus to promote health. And ought we not to mark the effect of trials on the Christian? What is the tendency of everything which causes the man of the world to despair when overwhelmed by adversities? It is to purify the pious mind, to promote its health, to wean it from all that is prejudicial to its real welfare. So our afflictions "work out for us a far more exceeding and eternal weight of glory." Hereby Christian graces are called into exercise; patience has its perfect work; and it becomes actually good for us to have been afflicted. Is there not in these dealings of the supreme Governor of the universe with the natural and spiritual, the mark of the same hand? Surely there is; and faith may learn to see the same God in both. No doubt there are men of science who may reject such inferences, and declaim against appending such notions to the details of physical search; but the Christian sees otherwise, and receives from all the incidents he meets with a different impression.

In reviewing the various diseases to which our best cultivated plants are subject, we have seen that there is not a cause of any one of them to which there is not some antagonism provided. These considerations lead us, by analogy, to look for some such provision against the diseases of the heart. We find it in the revelation of mercy God has made to man. There is only this difference, that while the antidotes to the pests which injure the fruit of our labours in the soil are as numerous as the pests themselves, the great remedy for all our moral miseries is but one, but that one is capable of every conceivable modification to suit the necessities of every case, and the wants of every age of the world. We may also remark that the analogy goes further. While the provision of natural antidotes does not preclude the exercise of human art to lessen the numbers of the destroyers of our food, neither does the great provision of the gospel hinder the agency of man, and the diligent use of means. On the contrary it encourages them, provided only that they be in entire subserviency to the one great principle, and confidence in the efficacy thereof, under whatever form we present our modes of action to the objects we design to effect. Supreme confidence in the great remedy does not in any degree manifest itself by cessation from activity, but it rather signifies upon what grounds we may most effectually exert ourselves to do good. And in nothing does the wisdom of God in Christ more abundantly appear, than in accommodating this beautiful law of action not only to this or that particular society of men, but to the benefit of all mankind in the variety of climates, countries, and habits in which they may be found. If he had framed this method of counteracting evil and restoring the lost happiness of man for one nation alone, it would have been an evidence of a particular wisdom, but in the suitability of the gospel to ameliorate the present state, and secure the future bliss of his fallen creature in all lands where the gospel comes, he has exhibited an infinite and universal wisdom. Thus there is no true Christian who, by the exercise of the opportunities God has given him, may not help to bring in a revenue of glory to his Saviour, and a harvest of profit to his fellow-men.

The author, then, in conclusion, would commend these thoughts to the serious consideration of his readers. Long have great moral diseases consumed the best fruits of many portions of our land. We have thought too much of reaping the pro-

duce of the labours of men's bodies, and have regarded too little the serious account to which we must be called for our neglect of the one great remedy of their souls. While the farmer looks upon the rural population in his fields, tilling the soil, reaping the golden corn, or gleaning the ears that have fallen from the sickle, may he think on the duty of marking well the real destroyers of the happiness of our cottages, and diligently strive, by example, advice, and influence, to diffuse amongst them a love of that knowledge which can alone lead to an acquaintance with, and a true correction of, the ills which have long prevailed amongst thousands of the peasantry of this country. How anxious are all cultivators of the fields that they may be white to the harvest, and free from the defects engendered by such causes as those we have described. They are willing to try every species of corrective, and to apply every possible remedy. But let us recollect that there is such a thing as a spiritual harvest, and that we are suffering it to become infected by negligence of that which has been so mercifully provided for its beauty while growing, and purity when gathered into the Lord's garner, into which the wheat is to be taken, while the chaff is to be burned up with unquenchable fire. Men having possessions are stewards for God, and are as much responsible for their moral efforts amongst those who labour in these possessions, as the employed are for their diligence in the tasks meted out to their hands. Suppose a man to whom the seed for a large farm was entrusted, had omitted to dress it, and, in the time of reaping, the ears were found, to a great extent, destroyed by the nauseous fungus which replaces the flour. Whose would the responsibility be? Will not a like solemn day of account come for those who have influence over men of low estate, and neglect to regard the culture of their minds, and to sow amongst them, in all possible purity, the seeds of that truth which is essential to salvation?

These remarks, it is trusted, will be regarded as natural inferences from the subjects before the reader. Desirous to communicate knowledge to the farmer, the author cannot forget his higher calling as a minister of the word of life, and he is one of those who believes that science may be made a fitting channel for conveying occasional hints upon the greater verities of the gospel. The wisdom and goodness of God which shone in weaker rays in the morning dawn of nature, break forth with stronger beams in the scheme of redemption, now that the Sun of righteousness has risen with healing in his wings, and the day hath appeared. We, then, should live as children of the day; and we should remember that we see the things of creation, as the key of knowledge opens them to our view, not in the light of early morn, before the mists had begun to melt, but with the advantages of those on whom the true light shineth. There is not a thing so small, so mean, or so low, as to be incapable of reflecting some beam of this light, not merely for the expansion of our intellectual faculties, but for the instruction of our spirits, affording rich matter not only for our heads, but our hearts. The grace of God does not destroy nature, but elevates it; so the fuller discoveries of the wisdom of redemption quicken the admiration of the eye that rests upon the works of the Divine hand below; and never did the psalmist send forth sweeter notes, prophetic of the Saviour, than when he had previously dilated on the perfections of God as the framer of the world, and all species of creatures. With him we may well say, "O Lord, how manifold are thy works! in wisdom hast thou made them all!"

ON THE DIFFERENT SYSTEMS OF FARMING.

From the Farmers' Herald.

No oracle could have spoken more truthfully than did the great Burke when he said, "*the plough* was the first creditor on every country." That it should be so esteemed, is not to be wondered at, when we come to reflect how important it is to field tillage.

It is *the* implement of agriculture, 'par excellence'; and from the first mention of it in Holy Writ, 1451 years before the christian era, to the present time, it has ranked high in husbandry, and its *proper use* has been extolled.

Admitting as all must, that no farming operations can be carried on successfully without its aid, is it not grevious to see how little its immense power has been brought to bear upon the virgin earth or subsoil, the productive pabulum of the corn field?

The giant plough-share has been allowed to slade sleepily over the ground, instead of vigorously entering into, and invading its vast and prolific womb. To break up the surface, bury the weeds and manure, and put on, as it were, a clean face to the fallows, is all that seems to have been aimed at, and that too with often four huge horses "to the fore." The same thin crust is turned over year after year; the same four, five, or, at the most, six inches of earth are exposed to the wind and the rain, the sun, and the frost, and this is the aver age extent or depth open in nature's store-house to supply food for England's daily added thousands. More than half the arable land of this country, has yet to experience the full value of a good deep ploughing.

This surely cannot be making a *proper use* of the plough. An all-bounteous and wise Providence, has placed a powerful instrument in the hands of his feeble creature man, that he may be enabled to "bring food out of the earth," even "bread" that strengtheneth man's heart. The ingenuity of agricultural implement makers, and of very many practical farmers of a mechanical turn of mind themselves has done much towards improving the shape, and facilitating the labour of the plough; great things have been done by them, but, unhappily, their efforts have not been carried out by the farmers. The plough must go deeper into the earth, ere its *full and proper use* can be said to have been attained, England's wants cry aloud. cheap bread must be had from our own fields, or from foreign shores; the agriculturists at home can decide for themselves, which it shall be. In days gone by, a ploughman constructed his own tool; rude enough in shape doubtless, and of a different genus to the noble implements now exhibited at the agricultural meetings; yet it had an advantage—the artist loved his own handy work, repaired it when broken, and took a pleasure in using it. Very possibly he was proud of it, and looked back upon his straight, and well rounded furrows, and evenly laid head lands, with a feeling of delight. Now this was all right and praiseworthy, and it were right that ploughmen of the present day should take the same interest in their work, and be taught and encouraged to excel in their noble, useful, and profitable art. Who was more fond of his plough and his field labours, than the brave Cincinnatus, the celebrated Roman, who was informed as he was ploughing, that the Senate had chosen him dictator? History tells us he left his work with regret, and repaired to the field of battle, where his countrymen were closely besieged by the Volsci and Equi.—He conquered the enemy, and returned to Rome in triumph, and sixteen days after his appointment he laid down his office, and retired to plough his fields. Again, was not "Elisha" a ploughman, and at work with twelve yoke of oxen in the field, when he was called by the word of the Lord to Elijah, to be a prophet in his room? Let ploughmen now be taught to look at the good and the great, as having gone to the same hallowed labour before them, and let them be made to feel its importance, and to love their work. A good seaman loves the ship in which he has ploughed the vast ocean; he looks upon her almost as a living thing; calls her his "heart of oak"; and treads her clean decks with the pride and delight of a true British Tar. The veriest old tub that swims is loved, and in after times, often viewed with a tear of joy. A railway engine driver claps the burnished sides of his steed of brass and iron with a feeling of pride; tells of its speed; says it can do all but speak; and off he starts it with a scream and a snort, like a warrior of old rushing to the wars. Why not then plant the same index of pleasure in the breast of the ploughman, whose work is of more consequence than any other, and whose peaceful sword cleaves the earth for the food of all mankind? If a good loam be needed, what can give it better than deep stirring up the dead soil. Mingling the varied strata, airing and vivifying the sterile subsoil, into a state fit for maturing vegetation. Again then, I say, whatever the soil, plough as

deep as you can, make the plough imitate the spade, and let the fields bring forth adundantly, as do gardens.

Amongst many proofs of the benefit of deep ploughing and stirring the soil, I will mention one or two in this immediate neighbourhood.

In 1845, a nine acre field of good turnip land was divided into three equal proportions; number one containing exactly three acres, was ploughed up the usual depth of five inches; number two of three acres was ploughed ten inches; and number three was ploughed first eight inches deep, a second plough following and loosening the soil five inches more. Eight loads of yard dung, and three bushels of "Lawe's patent manure," were used per acre. The seed was sown in May, on the ridge.

All came up pretty evenly. In July, numbers two and three took the lead, and produced both of them good plants.—In November, a rood of each taken fairly from the field, was weighed:

No. 1 produced at the rate of 16½ tons per acre.
2 do do 22 do
3 do do 27½ do

In 1846, the same field was got ready for barley. Seeds were sown, and all were served alike. In September, the crops were thrashed—

From No. 1, 11 sacks to the acre were obtained.
do 2, 12 do do
do 3, 13½ do do

The clover layer was not weighed, but the eye could tell the difference between shallow and deep ploughing.

Black sandy land has been similarly tried with advantage.

Further proofs I could bring, but let the above suffice for the present. England can grow the best corn, as she already does the most, per acre if she will. The game is in her own hands. A system of deep ploughing, rich manuring, thin seeding, and constant stirring and cleaning, with judicious cropping, will advance the interests of the British farmer more than all the Parliamentary petitioning in the world.—*West Norfolk.*

From the Preston Guardian.

SECOND ANNUAL EXHIBITION OF THE ROYAL NORTH LANCASHIRE AGRICULTURAL SOCIETY.

SPEECH OF HEWITT DAVIS.

Hewitt Davis, Esq., one of the judges, said—My Lord and gentlemen—My visit to Preston has been one of extreme pleasure, for I have come here in an enlightened district, among gentlemen whose pursuits have caused them to look to science as a means of attaining fortune, and find them lending their aid to extend the benefits of science to a class that has hitherto derived but little advantage from its aid. (Cheers.) Agriculture hitherto has been a pursuit learned by the son from the practice of his father, little aided by the information that science has diffused; they have been but little aware of what a scientific knowledge of chemistry, botany, and mechanism would do for them, but fortunately those are now brought home to them by such societies as this. Farmers are by this means brought together, and are here shewn what others have done, and by rivalry, which I look upon as the source of all information, they are being led forward in the pursuit of knowledge and a better practice (cheers.) Now, gentlemen, in addressing you, I am addressing you as if I were not a farmer; but I am a farmer, and my means have been considerably enlarged by the pursuit (cheers) In my early life I had the advantage of an education, that has taught me the importance of reducing everything I am about to engage in to figures, and it has been my knowledge of accounts that has made me a farmer. It is necessary that I should bring this fact before you, because advocating as I do a new system, having started a new routine, I have obtained the character of being a speculative farmer, but you, gentlemen, who appreciate the value of figures, will say that I am for no speculation (cheers) From early life I was made an economist; and true economy has taught me never to hesitate in spending £5 if I could gain £6 by the transaction; but to enable every one to do this they must understand accounts (cheers.) I am brought forward as an advocate of thin sowing. I was taught farming on the old principle of sowing two and a half bushels of wheat to an acre, and I afterwards saw that where by accident a greater amount of seed was deposited, there the crop suffered in the early springs and at harvest there was not so much corn at that place as where less seed had fallen. It was from this that I commenced sowing less seed, and I went on every year gradually, not speculatively, reducing the amount till I brought it down to one bushel (cheers.) This may appear to be a matter of small importance, but when I tell you that if the saving which has been of so much importance to myself were carried out throughout the United Kingdom, it would amount to more than the average supply of corn that this country has drawn for the last twenty years from other countries, and that the saving in money would amount in value to more than seven or eight million pounds per annum—because the practice I follow in regard to the sowing of wheat I also observe with respect to other grain, and derive a like advantage (cheers.) I have found from experience the success of thin sowing, and naturally sought for a reason why it should produce a larger crop. I perceived that a larger number of grains were deposited in the ground, and that more plants were produced than by any possibility could be obtained by the old system of sowing; and I was led to reason what was the consequence of this. If you were to plant a dozen acorns upon a square yard of ground, you would very soon have a dozen small trees growing, and a yard would in a very short time, become too confined for them; each tree would trespass upon its neighbour, and the natural consequence would be that out of the twelve not one would be healthy; and after a period only so many would remain as there might be space and food to enable to reach maturity.—Exactly the same result follows from sowing too much corn. All know what extraordinary success has attended gardeners in producing finer vegetables, and by what means they have attained this. One of the means taken by gardeners to produce full grown plants is, taking care that from a certain period each plant shall have room to develope itself to the full size. This plan is adopted by the farmers with regard to the turnip, although I don't think that they allow it sufficient room. They don't calculate at an early period the space which the turnip requires, still they know the necessity of putting in the hoe and thinning the turnips. But why should gardeners find it necessary to sow peas and beans thinly in a garden, and yet the same thing should not be attended to in the field? It is because farmers have not been taught to calculate; they do not understand figures—do not bring that mathematical education, if I may use the term, which is necessary, into the pursuits of farming (cheers.) By giving corn space at an early stage, it is enabled to attain maturity. Each plant is not unduly pressed by its neighbour, and the earth is not unduly robbed of a quantity of manure to support a number of useless plants. This is the theory of thin sowing; but there is another consideration attending it which I look upon as one of the means of introducing a better system of farming in another respect, namely, that of cleaning land. I found that it was much easier to clean the land of weeds by hoeing each crop than it was by allowing it to require a fallow by neglecting it for three or four years, thus losing the value of a year's crop upon the land; and besides, there is no expense so great as that of cleaning fallow land. The expense of a fallow is £4 or £5 an acre; and I find that not half that sum is spent in sowing each crop thin and keeping it clean, so that by this system is not only the expense of the fallow land saved, but each year a larger crop is obtained (hear, hear.) Thin seeding, therefore, is a matter of very great importance, whether we look to the saving of corn or to its waste (hear). It is a most extraordinary fact, that hitherto one-tenth of the grain grown in this country is again returned to the earth in seed; of every ten bushels of wheat one is for seed—and yet what is the fact? A grain of wheat, when planted out singly, when given space enough to reach maturity, returns two or three thousand fold, whilst it only returns the former under the present system ten-fold. Surely if nature gives us the power of raising a thousand-fold, man is very backward indeed in only raising ten-fold; but such is the fact. I have thought that

was the most striking point to draw attention to—the waste of seed which has hitherto taken place. I have laid great stress upon the annual waste of seven or eight millions of money, by the loss of two or three million quarters of corn, annually; but I have a greater consideration in bringing the matter before your attention. I wish to prove by a scientific principle, that you cannot have fruitful crops without keeping the land clean. In arguing with farmers upon the subject I always say, if you have a rich pasture and find that a quantity of donkeys are turned in amongst the other cattle, you desire that the trespassers may be removed, and if asked why, you say because the trespassers are consuming the nutriment which is wanted for the other cattle. Is not that also the case if they allow weeds to grow amongst their corn? By keeping the land clean they discover that it requires a great deal less manure than was before thought necessary. I find that by thinning the corn there is far less occasion to manure the land; so that in every respect is the expense of growing corn reduced. In mentioning these things to farmers, my advice to them in trying the experiment is never to trust the sowing of the whole field; but I must say that if they sow it thick they will have failure, whereas if they have it thin and distributed in equal proportions, and if they keep the weeds down they will grow the most grain with less seed, of course supposing that they use enough (cheers). My pleasure to-day has been very much increased by finding that you have here in many respects a better class of implements than I find in the south of England. I attribute much of the fact of farmers not failing, and being able to sell corn now at 60s. a quarter, when 30 years ago it was generally understood that 80s. was necessary to remunerate the producer, to the improvement in implements. Thirty years ago four horses were employed to do the work which can now be accomplished by two. At the present day we are enabled to plough with two horses where four were formerly required; and two horses are sent to market to draw manure, whilst at the date to which I allude, not less than three or four would have been required. This neighbourhood in particular, I find enjoys the advantages of lighter carts than we have in the south of England. It is an ordinary matter in this part of the country for one horse to draw a ton and a half on the road, whilst in Sussex, Surrey, and I am afraid to say in the greater part of the south of England, the carters would generally grumble if only two were allowed for that weight. They have a load in their waggons themselves, and the carts are so made that instead of the wheels acting properly, they drag upon the axles. In a large part of the south of England they still use wooden axles, three or four times as thick as those you have, for the wheels to turn upon. In addition to this, in order to give strength to the wheels, they require to be considerably dished, the consequence of which is that when the horse draws straightforward the natural tendency of the wheels is one to draw to the right, and the other to the left hand (hear). I bring this before you in order to show the benefit derived from such meetings as the one we have had to-day. I come here from the south of England, and see the make of a cart, which strikes me as being a considerable improvement if by its means we can save one horse in four or five. Only think how much the expense of a farmer is reduced by this single article. I will not take up your time by bringing before you any other instances to show the benefit to be derived from class association. What is it that makes science progress but the exhibition to the public of the improvements in machinery made by others? Our improvements in machinery have all had their origin in a spirit of rivalry, in the natural desire which each man has to excel his neighbour. The result of societies like these is to furnish the farmers who seldom travel with a means of knowing the advancement that is being made, with a knowledge of the state of perfection to which things are being bro't in the world at large (cheers.) And there is every inducement to bring home to the farmers who won't travel the various scientific improvements, so that they may in their own districts, with little trouble and without much loss of time, have the means of seeing the progress which is being made for their benefit (cheers.)

From the Farmers' Magazine.

THE NETHEREXE FARMERS' CLUB.

ON THE USE OF BONE MANURE.

At the monthly meeting of this club, Mr. Robt. May, the president of the club, in the chair, the subject of bone manure as a fertilizer for turnips was introduced by Mr. J. Griffin, who read a valuable paper detailing the result of his own experiments, the substance of which we here give.

Mr. Griffin commenced by stating that he should only relate facts—facts which had come under his own cognizance, because it would be presumptuous in so young a member to theorize, still more to lecture his neighbours, most of whom were older than himself; but the experiments he had made were, perhaps, worthy the attention of farmers who occupied light, sandy soils—soils of the same description which he himself occupied, and on which these experiments had been made. It had been stated that crushed bones, when used in their raw state, remained in the land for so many years that their employment was not profitable to rack-renters or tenants with short leases. There was much truth in that argument, but the researches of modern science had provided a remedy—the bones could be dissolved in oil of vitriol (sulphuric acid,) a chemical combination would take place between the acid and the bone (a great portion of which consisted of lime,) and by the action of the two, superphosphate of lime would be formed—a manure whose fertilizing effect would be very soon brought into action. He would, however, first state the result of his experiments with raw bone. He commenced using this manure in the summer of 1844, on a field of three acres, which he divided into three equal plots — He manured No. 1 with 2 qrs. of bone, at a cost of 38s. No. 2, with 3 cwt. of guano, mixed with 3 bags of ashes at a cost of 39s. No. 3, with 10 loads of dung, at 6s. per load, £3. At the first appearance of the turnips, those manured with guano looked best; with dung the next, but not very thriving; whilst the third portion (manured with bone) looked sickly and barren, which was attributable partly to the dryness of the season, there having been no rain for several weeks after the turnips were sown, as after the rain came they recovered, and at stocking time they formed the best crop of the three. On that portion of the land on which the bone had been applied, he had seen a remarkable difference in every crop since, showing the lasting benefit of this manure. In the following year, he again tested bones against farm-yard dung, when the former had decided superiority from the first appearance of the plant up to stocking time, and the cost was two-thirds less. He also used bone for Swedes, with a similar result. In 1846 he began dissolving bones for common turnips; to prove its efficacy he manured a piece of ground adjoining with unprepared bone, and although this gave a good crop, it was far behind that of the dissolved bone, besides which the action of the latter is much quicker, and it can be depended upon, no matter what the season, whether dry or wet. It was an old proverb, that "seasons would beat judgement," but the use of this manure would go far to prove that this, like many other old sayings, was a fallacy, or, at least, not always applicable, as he believed the use of this manure, combined with the other requisites of good farming, would insure a crop of turnips on soils adapted for their growth such as poor, light, sandy, or gravelly soils. He used eight bushels of bones per acre to 80 lbs. of acid; this he had found by experiment, to be a liberal dressing, sufficient to insure a good crop, if not attacked by fly or wireworm; and it was perhaps extraordinary, but in no instance had he suffered from these pests on land which he had manured with dissolved bone. The cost of this dressing would be, at present prices, about 30s. per acre (bone 21s., acid 8s. 4d., dissolving and mixing with dry earth 6d.,) so that it is recommended for its cheapness as well as efficacy. He had given it a fair trial, and intended to follow it up to a greater extent, because he was convinced that no other manure would insure a crop of turnips so cheaply. He had also tried fermented or partially decomposed bone against bone and acid, which gave him a good crop; but the part dressed with dissolved bone

was fit to hoe ten days before that dressed with fermented, and fourteen days before the raw bone, and this proportion was preserved up to the winter. If asked as to his wheat crop, he could reply it was an excellent one, the best he had ever grown in his life, although in the worst field on his farm —he had 100 stitches per acre, and this he considered another proof of the fertilizing properties of bone and acid. He had also tested the value of this preparation as a fertilizer against lime and salt. At Christmas, 1846, he had ploughed down an errish field, and manured it with five cart-loads of long dung per acre, which he valued at 4s. per load. When he tilled his turnips on a portion of this field, he drilled 4 bushels of bone, mixed with 40 lbs. of acid per acre, at a cost of 16s. and on another portion he used lime and salt, at a cost of £1 10s. He estimated, but he regretted he had not weighed them, that he had three times the weight of bulb in that portion dressed with the superphosphate more than where he had used salt and lime; the cost of the one, including the dung, carriage, and spreading, being 40s., and that of the other about £4 per acre. During the last season he had also used partially-heated bones and guano against dung; 8 bushels of bones, with 1 cwt. of guano mixed with 2 bags of ashes at a cost of about 36s. per acre. On one acre of the same field he used 10 loads of very good dung, at 6s. per load; the carriage and spreading of which cost 10s. more, making £3 10s. The produce on this acre was very inferior to the rest of the field. The fly attacked the plant in a most dreadful manner so that he had almost made up his mind to plough it up; and what was more remarkable, although every part of the dunged portion was ravaged by this destructive insect, they never attacked the part manured with bone. Ultimately the dunged part produced about half a crop, and the other part a most excellent one. He thought this statement worthy of their consideration; he had saved one-half the expense of manuring, and produced a very superior crop. If the dung had to be brought from a great distance, its cost was still more expensive. He knew something of this expense from his own experience, when he sent his team twice or thrice a week to Exeter, at an enormous cost; and this had led him to seek for something better, and which would better answer his purpose. He wished, however, not to be misunderstood. He was not speaking against dung; he recommended them to make as much good dung on their farms as possible; but, to do that, they must grow turnips; and this he had shown could be done without purchasing dung, and incurring the great cost arising from wear and tear of waggons, &c., by bringing it from a great distance. He next described his method of dissolving the bone, which is very simple. As much bone-dust as is required for the field is thrown into a heap, about a foot in height, and well moistened with water from a watering-pot, to insure its being regularly done; and continue this until the bones will absorb no more water.—The acid, then, having been carefully emptied out of the carboy (but not into any metallic vessel,) is gradually poured over the mass, at the rate of 10 lbs. per bushel, if of full strength; another person continually turning the heap until the bone is nearly dissolved, which will be in a short time, if the acid is good. This being done, a sufficient quantity of dry earth or ashes must be mixed with it, to make it dry enough to pass through the drill; then cover it with the same substance, and bank it up as close as possible. It must remain in that state for a few days, and then be turned back regularly; when, if not dry enough, add some more dry substance (nothing is better than road dust, if it can be got.)—It should be turned over several times before it is used; and the proper season for its use is the month of April. He had twice dissolved the bone in old casks; but he recommended dissolving them in a heap, in a convenient outhouse, as the simplest. He would advise all light-land farmers to give it a fair trial, and he was sure they would not soon abandon it. He could not give an opinion as to its value on heavy lands, but it might act beneficially there also; at any rate it would be worth a fair trial. Having made some remarks as to the price, advising them to buy the strongest and most concentrated acid, which would be found the cheapest in the end, he concluded by strongly advising them to make their own superphosphate in the way he had pointed out; and by showing that unless they raised good root crops they could get no beaf or mutton, and without that no good stall fed dung, and, consequently, but little or no corn.

From the Farmers' Journal.

SOILS.

Practically, a knowledge of the external characters of soils is a matter of no great difficulty; for, however complex the composition of any soil appears to be, it possesses a character belonging to its kind which cannot be confounded with any other. The leading characters of ordinary soils are derived from only two earths, clay and sand, and it is the greater or less admixture of these which stamps the peculiar character of the soil. The properties of either of these earths are even found to exist in what seems a purely calcareous or vegetable soil. When either earth is mixed with decomposed vegetable matter, whether supplied naturally or artificially, the soil becomes a loam, the distinguishing character of which is derived from the predominating earth. Thus, there are clay-soils and sandy-soils, when either earth predominates; and when either is mixed with decomposed vegetable matter, they are then clay loams and sandy loams. Sandy soils are divided into two varieties, which do not vary in kind, but only in degree. Sand is a powder, consisting of small, round particles of silicious matter; but when these are of the size of a hazel-nut, and larger—that is, gravel—they give their distinguishing name to the soil; they then form gravelly soils, and gravelly loams. Besides these, there are soils which have for their basis another kind of earth—lime, of which the chalky soils of the south of England consist. But these differ in Agricultural character in nothing from either the clay or sandy soils, according to the particular formations from which the chalk is derived. If the chalky soil is derived from the under chalk-formation, its character is like that of clay. Writers on Agriculture also enumerate a peat-soil, derived from peat; but peat, as crude peat, is of no use to vegetation, and when it is decomposed, it assumes the properties of mould, which forms the essential ingredient of loams, is decomposed vegetable matter, derived either from nature, or from artificial application. So, for all practical purposes, soils are most conveniently divided into clayey and sandy, with their respective loams.

Loam, in the sense now given, does not convey the idea attached to it by many writers, and many people talk of it as if it must necessarily consist of clay. Thus Johnson, in defining the verb 'to loam,' gives as a synonyme the verb 'to clay;' and Bacon somewhere says, that the 'mellow earth is the best, between the two extremes of clay and sand, if it be not loamy and binding,' evidently referring to the binding property of clay. Sir Humphrey Davy defines loam as 'the impalpable part of the soil which is usually called clay or loam.' And Mr. Reid defines the same substance in these words:—'The term "loam" is applied to soils which consist of about one-third of finely divided earthy matter, containing much carbonate of lime. Other soils are peaty, containing about one half of vegetable matter.' Professor Lowe gives a more correct, though in my opinion, not the exact idea of a loam. 'The decomposed organic portion of the soil,' he truly says, 'may be termed loam;' but, he continues to say, and this is what I doubt, that 'the fertility of soils is *cæteris paribus*, indicated by the greater or smaller proportion of mould which enters into their composition. When soils are thus naturally fertile, or are rendered permanently so by art, they are frequently termed loams.' You thus see what diversity of opinion exists as to what loam is. Loam, in my opinion, has changed its meaning so far since the days of Johnson, as to consist of any kind of earth that contains a large admixture of decomposed vegetable matter,—I say a large admixture of vegetable matter, because there is no soil under cultivation, whether composed chiefly of clay, or principally of sand, but what contains some decomposed vegetable matter. Unless,

therefore, the decomposed vegetable matter of the soil so preponderates as to greatly modify the usual properties of the constituent earths, the soil cannot in truth be called by any other name than a clayey or sandy soil; but when the vegetable matter so prevails as materially to alter the properties of those earths, then a clay-loam or a sandy loam is constituted—a distinction well known to the Farmer. But, if it is necessary that clay should have a preponderance in loam, then a sandy loam must be a contradiction in term. Again, a soil of purely vegetable origin, such as crude peat or leaf mould, cannot be called loam, for admixture of an earth of some sort is required to make loam, under every recorded definition of that term. Nor is the fertility of soils dependent on the greater or smaller proportion of mould or decomposed vegetable matter in their composition, for there are soils with apparently very little mould in them, such as sharp gravels, which are highly fertile; and there are moulds, apparently with very little earth in them, such as deep black mould, which are far removed from fertility. Thus, then, all soils have the properties of clayey or sandy soils, and a considerable quantity of decomposed vegetable matter converts them into loam, as is exemplified in the vicinity of large towns.

A pure clay-soil has very distinctive external characters, by which you may easily recognise it. When fully wetted, it feels greasy to the foot, which slips upon it backwards, forwards, and sideways. It has an unctuous feel in the hand, by which it can be kneaded into a smooth, homogeneous mass, and retain any shape given to it. It glistens in the sunshine. It retains water upon its surface, and makes water very muddy when mixed with it or runs over it, and is long of settling to the bottom. It is cold to the touch, and easily soils the hand and anything else that touches it. It cuts like soft cheese with the spade, and is then in an unfit state to be worked with the plough, or any other implement. When dry, clay-soil cracks into numerous fissures, feels very hard to the foot, and runs into lumps, which are often large, and both large and small are very difficult to be broken, and, indeed, cannot be pulverised. It soils the hand and clothes with a dry light-coloured soft dust, which has no lustre. It is heavy in weight, and difficult to labour. It absorbs moisture readily, and will adhere to the tongue. When neither wet or dry, it is very tough, and soon becomes very hard with a little drought, or very soft with a little rain.

On these accounts it is the most ticklish of all soils to manage, being, even in its best state, difficult to turn over with the plough, and to pulverise with other implements. A large strength of horses is thus required to work a clay-farm land; for its workable state continues only for a short time, and it is the most obdurate of all soils to labour. But it is a powerful soil, its vegetation being luxuriant, and its production great. It generally occurs in deep masses, on a considerable extent of flat surface, exhibiting only a few undulations. It is generally found near a large river, towards its estuary, being supposed to have been a deposition from its waters. Examples of this kind of soil may be seen in Scotland in the carses of Gowrie, Stirling, and Falkirk. It may be denominated a naturally rich soil, with little vegetable matter in it, and its colour is yellowish grey.

When sand and gravel are mixed with clay, its texture is very materially altered, but its productive powers are not improved. When such a clay is in a wet state, it still slips a little under the foot, but feels harsh rather than greasy. It does not easily ball in the hand. It retains water on its surface for a time, which is soon partially absorbed. It renders water very muddy, and soils everything by adhering to it; and, on that account, never comes clean off the spade, except when much wetted with water. When dry, it feels hard, but it is easily pulverised by any of the implements of tillage. It has no lustre. It does not soil the clothes much, and, though somewhat heavy to labour, is not obdurate. When betwixt the states of wet and dry, it is easily laboured, and can be reduced to a fine tilth or mould. This kind of soil never occurs in deep masses, but is rather shallow; is not naturally favourable to vegetation, nor is it naturally prolific. It occupies by far the larger portion of the surface of Scotland; much of its wheat is grown upon it, and it may be denominated a naturally poor soil, with not much vegetable matter in it. Its colour is yellowish brown.

Clay-loam—that is, either of these clays mixed with a large proportion of naturally decomposed vegetable matter—constitutes a useful and valuable soil. It yields the largest proportion of the fine wheats raised in this country, occupying a larger surface of the country than the carse-clays. It forms a lump by a squeeze of the hand, but soon crumbles down again. It is easily wetted on the surface with rain, and then feels soft and greasy; but the water is soon absorbed, and the surface is again as soon dry. It is easily laboured, and may be so at any time after a day or two of dry weather. It becomes finely pulverised, and is capable of assuming a high temperature. It is generally of some depth, forming an excellent soil for wheat, beans, Swedish turnips, and red clover. It is of a deep brown colour, often approaching to red.

All clay soils are better adapted to fibrous-rooted plants than to bulbs and tubers; but it is that sort of fibrous root which has also a tap root, such as is found in wheat, the bean, red clover, and the oak. The crops mentioned bearing abundance of straw, the plants require a deep hold of the soil.—Clay-soils are generally slow of bringing their crops to maturity, which in wet seasons they never arrive at, but in dry seasons they are always strong, and yield quantity rather than quality.

A pure sandy soil is as easily recognised as one of pure clay. When wet, it feels firm under foot, and then admits of a pretty whole being laid over by the plough. It feels harsh and grating to the touch. When dry, it feels soft, and is so yielding, that every object of the least weight sinks in it: it is then apt to blow away with the wind. In an ordinary state, it is well adapted to plants having fusiform roots, such as the carrot and parsnip. It acquires a high temperature in summer. Sandy soil generally occurs in deep masses, near the termination of the estuaries of large rivers or along the sea-shore; and in some countries in the interior of Europe, and over a large proportion of Africa, it covers immense tracts of flat land, and is evidently a deposition from water.

A gravelly soil consists of a large proportion of sand, but the greater part of its bulk is made up of small rounded fragments of rock brought together by the action of water. These small fragments have been derived from all the rock-formations, whilst the large boulders, embedded principally under the surface, have been chiefly supplied by the older formations. Gravelly deposits sometimes occupy a large extent of surface, and are of considerable depth. Such a soil soon becomes warm, but never wet, absorbing the rain as fast as it falls; and after rain it feels somewhat firm under foot. It can be easily laboured in any weather, and is not unpleasant to work, though the numerous small stones, which are seen in countless numbers upon the surface, render the holding of the plough rather unsteady. As an instance of its dry nature, an old Farmer of gravelly soil used to joke with his ploughmen, and offer them a 'roasted hen' to their dinner, on the day they got their feet wet at the plough. This soil is admirably adapted to plants having bulbs and tubers; and no kind of soil affords so dry and comfortable a lair to sheep on turnips, and on this account it is distinguised as 'turnip soil.'

Sandy and gravelly loams, if not the most valuable, are certainly the most useful of all soils. They become neither too wet nor too dry in ordinary seasons, and are capable of growing every species of crop, in every variety of season, to considerable perfection. On this account they are esteemed 'kindly soils.' They never occur in deep masses, nor do they extend over large tracts of land, being chiefly confined to the margins of small rivers, forming haughs or holms, through which the rivers meander from their sources among the mountains towards the larger ones, or even to the sea; and in their progress, are apt at times to become so enlarged with rain, both in summer and winter, as to overflow their banks to a limited extent on either side.

These are all the kinds of soil usually found on a farm;

and of these the two opposite extremes of the pure clay and the pure sand may most easily be recognised by you. The intermediate shades in the varieties of soil, occasioned by modifications of greater or smaller quantity of decomposed vegetable matter, it would be impossible to describe. Every soil, however, may be ranked under the general heads of clay and sandy soils; the gravelly and sandy, as you have learned, *constituting differences rather in degree than in kind*; and as every soil possesses the property of either clay or sand—be the sand derived from siliceous or calcareous deposits—it is useless to maintain the nomenclature of chalky and peaty soils, although these distinctive terms may be retained to indicate the origin of the soils thereby implied by them.

TURNIPS:—BONES AND SULPHURIC ACID.

Last season I made the following experiment:—I measured off, in the field intended for turnips, three separate acres, which we will call one, two, and three, to number one, I applied three hundred-weight of finely ground bones, dissolved with sulphuric acid; I put the bones into a wooden vessel, over which I poured one hundred-weight of acid, and immediately added four hundred-weight of water, stirring all well together; it remained in the vessel forty-eight hours, being frequently stirred. I had previously prepared a heap of finely screened earth, of an old ditch, and coal ashes, in proportion of one of the latter to three of the former, sufficient to divide over an Irish acre. Before taking the mixture out of the vessel, I put in some of the compost to give consistency to the mass, and thereby lessen the risk of waste in taking it out of the vessel. The contents were emptied into the heap of compost, and by frequent turnings made into a fine free heap, which was applied by hand, in the following manner:—The land being prepared, and drills formed in the usual way, twenty-seven inches apart, I took off the seed covering roller from my two-drill turnip machine and attached the front roller, in order to compress the drills; and by deepening the coulters I formed ruts on the tops of the drills to hold the compost, which being deposited, I took off the front roller and put on the seed one, took up the coulter and sowed the seed, covering seed and manure together: the result was thirty tons of turnips per Irish acre. From my long experience of bones as a manure for turnips, I judged the above two small a dose in any shape for an acre, and added seven hundred-weight of ground bones to a like compost as that above mentioned, making ten hundred-weight of bones, three dissolved and seven not dissolved, and applied it to number two in the same manner as that of number one. The result fully met my expectation, being fifty tons of turnips per acre, divested of leaves; number three had twenty hundred-weight of bones put in as described above, and yielded forty-nine tons fifteen hundred-weight. Number one and two took the lead at first, but number one had soonest done growing. The kind of turnips was Skirving's improved purple-top bullock. So well pleased am I with the compost used for number two, that I am using it largely this season, and have recommended it to others. It may be right to remark, the land alluded to was a light, sandy soil, on a yet more sandy subsoil—in fact, the sand is within fifteen inches of the surface all through the field. I have been in the habit of using bones as manure for turnips and other crops, for the last thirteen years, and in various quantities, varying from ten hundred weight to thirty hundred-weight, but have always had the heaviest crops of turnips from bones at the rate of from twenty hundred-weight to twenty-five hundred-weight. In 1841, I had sixty tons per acre of purple top bullock, grown on bones at the rate of twenty-five hundred-weight per acre. The present oat crop on the three lots looks equally well.—*C. S. in Farmers' Journal.*

Method of distinguishing Iron from Steel.—Drop a little weak aquafortis on the metal; let it remain for a few minutes, and then wash it off with water. If it is steel, the spot will be black; but if iron, the spot will be whitish grey.

From the Albany Cultivator.

HABITS OF INSECTS.

The remarks of a correspondent of the *Cultivator*, under the head of "Spare the Spiders," suggest the importance of a knowledge of the habits of insects. The innumerable number of these, and the immense consequences depending upon them, are seldom properly considered. Many tribes attack the crops of the farmer, which fail more frequently from this cause than any other, except, perhaps, the effects of unfavourable weather. Famine and pestilence have at several periods ensued from their devastations in various parts of the Eastern Continent, and even in our own country, they have often occasioned great losses and no small amount of human suffering.—The "staff of life" has been nearly cut off in many instances, by the attacks of that tiny depredator, called the Hessian fly, and its equally insignificant congener, the wheat midge. Various crops have been destroyed by the wire-worm, the cut-worm, and the grasshopper; our fruits have been blasted by the caterpillar, the canker-worm, the curculio, and the aphis; and even the trees themselves destroyed by the insidious workings of borers and worms. Other species, again, prey on our domestic animals, and some directly attack, annoy, and injure the human race.

The more we know of these formidable enemies the better we can protect ourselves against their ravages. And in this view of the subject, perhaps there is no one fact of greater importance than this: nearly every species of insect that is injurious to man, is preyed upon and destroyed by some parasitic or predacious enemy. However revolting, at the first thought may appear this system of perpetual warfare among the tribes it is evidently a wise and benevolent principle, calculated to preserve the proper balance in this department of organic life, and affording proof that

"Nature's differences are Nature's peace."

In regard to one of the most destructive insects to the farmer, the Hessian fly, (to which allusion has been made,) its natural enemies are an important check to its increase. "Other insects," says Dr. Fish, "have been created apparently for the very purpose of preying upon this, and thus preventing it from becoming inordinately multiplied."

There are several species of these *ichneumons*, as they have been named, but one called the *Ceraphron destructor*, is the most common. It is a small bee-shaped insect, not much larger than the Hessian fly, and in the spring may be sometimes seen in great numbers in wheat fields; and the circumstance that it is often mistaken by farmers for the "fly" itself, strikingly exemplifies the necessity of understanding the economy of insects.

This ichneumon attacks the "fly" while in the "flax-seed" state, the latter lying dormant encased in a covering, which resembles in form and color, a flax-seed. It is between the stalk of wheat and the surrounding sheath. Instinct enables the ichneumon to know where its prey is lodged; it punctures the sheath, and deposites its egg in the body of the larva; the egg hathes and becomes a worm, which preys upon and destroys the larva of the "fly." It is thought by some naturalists, that at least nine-tenths of the larva of the Hessian fly are destroyed in this way.

Another very minute parasite of the Hessian fly, a species of *Platygaster*, according to Prof. Herrick, deposits its own eggs in those of the "fly." The latter hatch, and the worms pass into the flax-seed state with the young parasites in them, but they are destroyed before the next transformation is effected, and the parasites leave the shell.

Your correspondent before alluded to, has well illustrated the usefulness of spiders in destroying the troublesome house-fly, and in other respects. There are, however, several species of field-spiders which devour great numbers of crickets, grasshoppers, various kinds of moths, butterflies and beetles.

If, towards the latter part of summer, we look at the surface of a meadow or stubble field, early in the morning, while the dew is on and the sun is shining brightly, it will appear to be almost covered with spiders' webs. On examination, nearly every web will be found to have one or more of the above-na-

med insects in it, lately caught; and this ratio of destruction is carried on daily, through several weeks of the season.

The artful sagacity of the spider is in no case more displayed than when a grasshopper falls into his net. The moment the spider discovers his game, he decides on his course, which must be governed by the relative strength of the parties. If the grasshopper is very large, compared with the spider, the latter, on the principle that "prudence is the better part of valor," instantly cuts the threads of his net as closely as possible to the trespasser, and lets him escape with as little damage as possible to the premises. But if the grasshopper is not too large, the spider soon stops his *kicking* by the numerous coils which he throws around him with astonishing rapidity, taking care to bind strongly, the long legs of his prisoner, lest by their use he should spring from the web, or tear it asunder in his struggles. The largest spiders make the strongest webs, and are generally able to manage any insects that fall into them.

But the spider finds a powerful and uncompromising enemy in several species of the mason-wasp. The latter insect is well known from forming habitations for its young of mud or mortar, which is attached to the underside of the roofs of outbuildings, and other sheltered places. The cells in which the young are hatched and reared, are from an inch and a-half to two inches in length, arranged parallel to each other, each distinct and separate internally, but attached together by their outward surface. There are sometimes from four to six of them in a row. When the earthen house is completed, except the closing of the upper end of the long cells, which is done by a single lump of mortar to each, the female wasp deposits an egg at the bottom of each cell, and then proceeds to fill the cells with spiders, which are plastered in, their bodies constituting the food of the young wasp during its larva state, or till it passes through its transitions, and comes out a perfect wasp.

No particular selection is made as to the species of spiders —any being taken that can be crowded into the cells. They are put in *alive* too, and the labour of incarceration is by no means inconsiderable. I have repeatedly witnessed the efforts of both insects on the occasion. Sometimes the spider was so large, that a little exertion of its legs would render it difficult for the wasp to thrust it down the cell; but the work was always accomplished, though the amputation of the spider's legs sometimes became necessary.

Other species of the mason-wasp fill their cells with worms, instead of spiders. Doctor Harris has lately described one, which he calls the potter-wasp, that fills its cells with canker-worms, which it thrusts in alive, "end-wise," five full-grown" ones being put into each cell. Dr. H. remarks that if the worms were killed before they were imprisoned, they would become putrid before the young wasps were hatched; and the same may be said in regard to the spiders.

All the mason-wasps are exceedingly bold and rapacious, and seize their prey with surprising celerity—pouncing upon it with almost the quickness of lightning, and disabling it by a single blow, or probably by a thrust of its venomous sting.—The subtle art of the spider avails little against so powerful an adversary, and he generally yields on the first onset.

The large *blue-black* mason-wasp, with beautiful purple wings attacks and kills the largest grasshoppers, crickets and cock-roaches, besides occasionally showing his Herculean prowess in slaying the large black spider of the forest, whose fangs are like blacksmiths' pincers, and whose body, covered with bristly hairs, would be thought safe from the attacks of any *common* enemy. I once witnessed a combat between a mason-wasp and such a spider as I have just described. The spider, though vigorous and active at first, soon appeared as if struck with paralysis, and though not dead, could make no effort to repel its conquering foe. As soon as the spider ceased its exertions, the wasp attempted to drag it under a piece of bark; but the weight was too great for the strength of the wasp—it could scarcely move the body of its victim.

Last summer, I saw one of the black mason-wasps, attack and kill one of the largest of the green grasshoppers. By cutting off the grasshopper's long legs, he was quickly disabled. The wasp then excavated a hole in the ground, into which it rolled the carcase of the grasshopper, and buried it.

The aphis, or plant-louse frequently inflicts serious damage on the products and plants of the *field and garden*. Almost every kind of plant has its peculiar species of this insect. It possesses extraordinary powers of reproduction—*nine generations*, according to naturalists, being produced from a single impregnation. Their increase is therefore rapid, almost beyond comprehension, and from only a few in the early part of the season, they soon swarm in innumerable numbers. All sorts of young fruit trees, roses, and garden vegetables of different kinds, are sometimes overrun with them. They suck the juices from the fresh and tender leaves, which soon checks the growth of the plants—producing mildew and blight.

On the plants which are infested with the aphis, there is frequently seen various other kinds of insects, such as ants, flies, bees, the spotted lady-bird (or bug,) &c. Many people suppose that the object of all these insects is the same, that is, to feed on the plant or its juices; but their objects are only similar in one respect—all seek their food, though the food of the different races is quite dissimilar. All the aphis family excrete certain tubes through the posterior parts of their body, a sweet substance sometimes called *honey-dew, of which many* other insects are very fond. The ants, bees and flies are in search of this, and the former show great sagacity in obtaining it. They touch the aphides with their antennæ, which causes them to avoid the sweet drop, and it is instantly swallowed by the ants. From the constant attendants of ants in the manner described, the aphides have been called "the ants' cows."

The larva of the lady-bird, and the larva of the several species of syrphidian flies, feed on the bodies of the aphides, and in many instances devour great numbers of them. Few farmers or gardeners are aware of the great benefit they derive from these rapacious little animals. The past summer, some currant-bushes and snow-ball trees were shown me that were literally covered with aphides. On close examination among the aphides I discovered a few of the larva of the lady-bird and a species of syrphus. As there were but few of these I concluded they had but just discovered their prey. They continued to increase from day to day, and the aphides soon began to diminish, till in a week's time, scarcely one of the latter could be found.

Provided with a good magnifying-glass, I watched the movements of the aphis-caters. The larva of the lady-bird and the syrphus, kept up a constant slaughter. The former seized the aphide with its long forceps, and soon sucked out their vitals, leaving nothing but a thin shell, which it threw away. One of them was seen to devour half-a-dozen aphides in the space of five minutes, and a similar destruction seemed to be kept up by all. The syrphus was attached to the leaf by a glutinous substance, in the midst of the aphides, from which position it constantly supplied itself with victims.

Had not this article been extended to (perhaps) an undue length, I would have given more particular descriptions of these predatory tribes. I trust, however, that what has been said may serve to show the importance of knowing the habits of insects, that we may, especially, be able to

"Distinguish which to slaughter and which to spare."

NORTH LANCASHIRE AGRICULTURAL ASSOCIATION ANNUAL MEETING.

From the Maidstone Gazette.

DISCUSSION ON DRAINING.

The noble chairman called on Mr. Hewitt Davis to commence the discussion, which that gentleman did, by the following remarks:—

Mr. Davis, *in rising, said that the branch of the subject* they were about to discuss was not as to that description of drainage by which so much benefit had been derived, as in Lincolnshire, which was now producing food for a district of Great Britain, and was formerly covered by the sea, or in Holland, where a vast quantity of land had been rendered fit to be inhabited and cultivated by the drainage which had

taken place; but the branch of the question which he was about to introduce to their attention was that by which farmers and landowners of this country were called upon to make most productive a very large portion of the cultivated soil [applause.] The present age was remarkable for the progress of science; we were now enabled to travel thirty miles an hour instead of eight or nine, besides possessing many other advantages of a similar nature; but until within eight or ten years the farmer had received but little benefit from the study of science. This resulted principally from the want of education among those who were left to till the soil and produce food for the other portion of the population, but that want of progress could no longer continue if the position of the farmer was to be maintained, for they now had to contend with that which did not exist before, namely, a competition with all the world. We could no longer look to our ordinary means of raising corn if those supplies were to be raised at 40s. or 50s. a quarter. Nothing that had been brought forward to aid agriculture was of more importance than drainage. By its means, land before deemed all but worthless had been brought into competition with the finest soils in the country. Farmers found it necessary to get rid of the water that would stagnate upon the surface of the land, but the means that had been resorted to for that purpose, till the discoveries of modern science, were not the most suitable that could be adopted. It had been the practice to lay out the land so as to render the surface capable of throwing off the rain, but they now found by scientific experiments, that rain is sent for beneficial purposes and performs a variety of most important use, which are altogether lost by throwing the water off the surface. Rain is not clear water; it brings down with it one of the most fertilizing manures that we have, and if allowed to percolate into the earth, it leaves behind it that matter which is designed by Providence to be productive of all vegetation. Thus very great benefit was to be derived from merely causing the rain to percolate into the soil, instead of throwing it off. But so little had been understood with regard to drainage that not only was the rain, with the nourishing matter which it contained, thrown off the land, but every practical man knew that the first autumn rains usually carried away a large portion of that manure and fertilizing matter which man had brought to the soil. The first rains in the autumn must have a tendency to enrich the soil, and their object ought to be to induce the rain to descend into the earth, that it might fulfil the object for which it was designed. Then, with respect to the temperature of the soil. In spring the rays of the sun were calculated to warm the earth; but if those rays fell on the soil saturated with water, they were not only reflected back, but the most cooling process was caused by the action of the sun upon the wet soil, namely, evaporation. In illustration of the chilling effect produced by this evaporation, Mr. D. alluded to the experiments with ether in cases of fever on the brain; and in India recourse had long been had to evaporation, for the purpose of reducing water down to a freezing point. Water stagnant upon the land was thus liable to be evaporated by the heat of the sun, and the earth was actually chilled by the process; but if the land was drained, the water would percolate into the earth, and the sun's rays would warm the surface when a shower came, the warm moisture passed into the soil. So that a porous soil was warmed by the rain that falls, whilst a soil that is not porous was chilled by that which otherwise would tend to its enrichment and warmth.—He had thought it necessary to introduce what he had to say in this way, because there were a variety of opinions as to the modes in which drainage should be done. Some were for two, three, and four feet drains, and others were for going still deeper. There was a large class of occupiers of land who were of opinion that drains should not be put in clay soils at a greater depth than two or three feet, but this arose from a misconception that it was not porous. In summer time, any one who had happened to open a clay bed must have noticed the cracks that ran down the sides; and he had known clay soils in a dry summer crack to a very considerable extent, so that he was enabled to run stakes down for three or four feet, and he might have gone deeper had the cracks been straight. He contended that there was no difficulty in making clay soils porous by deep drainage. If they drained clay land shallow, the water was left at the bottom of the drain; that is to say, if the drains were put in two feet deep the water would be found at two feet one inch. Clay soil was remarkable for its power of attracting the water upwards, particularly when the sun warmed the surface. As the water passed away, vacuums were left which sucked up the moisture from below. All knew that walls draw water from the earth, and so does a bed of clay, which rests upon a porous bed beneath, draw water upwards. He then proceeded to show why we did not in this country get that high degree of temperature which is of the utmost importance to agriculture; contending that the more the drainage was increased, the greater would be the temperature, and if they did not drain deep the temperature was partial instead of complete. Deep drains in clay soils, he said, were beneficial not only in draining the surface, but in keeping it warm; and this was not only of importance for vegetation, but also for other purposes. Cattle, sheep, and animals of all descriptions, liked a dry bed to lie upon, because it promoted their greater health, being in this respect constituted the same as man. In our climate, by the aid of skill, we were enabled to grow large crops of corn; but no one could doubt that our island was too damp and cold for its proper growth. In former days, when Rome was mistress of the world, she drew her supplies of corn from Africa, Spain and Egypt, climates that are much better than ours, and if those countries in the present days were in a state to grow corn, there was no question that their climate placed them in a very superior position. It was of much importance to us to make our climate warmer and drier, for being an island we suffered too much from moisture. Perhaps there was no portion of England where a lecture on drainage could be of more advantage than at this part, for we are subject to much heavier rains than in any other part, and also to much greater dampness in the atmosphere, which rendered it highly desirable to introduce the drainage of land here. An important effect of drainage was to ameliorate the climate.—Every one must be aware of the difference in the air when passing over a wet district or common—it is cold and damp, and this was in consequence of the heat being imbibed by the water. Hence, in the House of Commons, he believed, it was customary in the heat of summer to hang damp cloths before the open windows, that the air in passing through should lose some of its heat, and we were all aware how much cooler a room was when wet by moisture. This being the fact, how much the climate of England might be benefited by becoming better drained! Not only vegetation would be increased, but man would feel the benefit of it [applause.] The first object of any one inhabiting a wet district should be to make his home comfortable by removing the water from around it. He hoped a great change was going on in England in this respect. The district he lived in was formerly a wild bleak common, and was called Cold Harbour, being one of the coldest spots in England, but when the land had been thoroughly drained it no longer retained its churlish name, but was called Spring Park, whether from the numerous springs in it, or from its more genial atmosphere, he could not say. The water was now taken four feet from the surface, and vegetation was now considerably before instead of behind, that of other parts of the country [applause] He believed that he was the first man in the parish to introduce drainage, and they were in great measure indebted to its adoption for the change which had taken place. There was another important benefit derived from drainage, and that was the reduced expense which it caused in tillage. A wet farm was always a very expensive one to cultivate. Not only was the labour of the animals increased in ploughing, but the owner of a wet farm was not at liberty to choose his time for ploughing and sowing; he must wait till he can find the earth drier. Again, these soils were not only often too wet but very often too dry, for a soil that was very wet in the

winter, frequently lost its moisture altogether in the summer. Thus the operations of the farmers were put back two or three weeks, when on dry soils they would be enabled to carry on during January, February, March and April, was frequently put past till April or May. The expense of drainage was an obstacle raised by many tenant farmers, but this was for the want of calculation. Many a farmer would complain at harvest time that he had lost £3 or £4 an acre in his crop, from wet in the spring of the year [hear, hear.] Now the expense of drainage seldom amounted to more than the money thus lost. There was no better investment a practical man could make in his land than drainage He had often seen the whole cost covered the first year after the land had been drained [applause.] Another desirable object was obtained by drainage; the land became pervious to the air, and no vegetation could go on unless the roots attained air, for it was a well known fact that plants might be killed by treading the soil so tightly round them that it became impervious. Wet made land impervious to the air, without which the soil could not support vegetation. Supposing, for instance, a plant required an area of six inches every way, six inches on the surface, and six inches underneath to support it; if the soil was made impervious down to twelve inches, then the plant would only require an area of three inches on the surface, getting the remaining six inches underneath. That was the reason why rich soils carried a much thicker pile of wheat or grass. It was the same with trees; on rich soil they could be planted closer together, for by making the soil previous to the air they increased the area from which the plant could draw nutriment. It had been his object to show the various advantages to be derived from drainage; and if there were any gentleman present who were still of opinion that clay soils could not be drained by placing the drains four feet from the surface, he hoped they would rise and provoke discussion by stating their objections to the plan he had advocated [applause.]

Mr. Gray, of Dilston, Col. Rawstorne, and other gentlemen took part in the discussion, which we much regret the state of our columns prevents our giving entire. Most of the speakers, however, gave the preference to deep draining.

NOTES ON SOME ENGLISH FARMING.

By Martin Doyle.

Continued.

Before I proceed to specify the modes of practice which in my humble opinion distinguish Mr. Davis from other extensive English farmers, I shall refer to the paragraph in my first paper on the present subject, in which it was stated that the proprietary and tenantry of Ireland might reclaim much of the waste lands of that country at less cost than that which has been incurred in the drainage and trenching of Spring Park farm. It occurred to me that Mr. Davis might have availed himself of the gravel raised from the drains, if screened, as the cheapest and most convenient material for drainage; but he stated to me as his reason for not using the round gravel instead that the expense of screening it would be greater than the cost of tiles, 1000 of which—an ample allowance to the acre—he can have laid down in his field for 18s., carriage included. That quantity of tiles is a load for two horses, and the rate of payment is 2s. per mile. Where labourers are paid 12s. a week, at least, the tiles are probably as economical; and Mr. Davis says that having tried coarse gravel he found that the water did not pass so freely through it as it does through tiles or pipes. But in Ireland, where labour is often but a third of the English rate, there is a decided advantage in favour of screened gravel over pipes or tiles, where gravel or small stones abound in the subsoil. There cannot be a more durable material for drainage, if even very lightly covered with Heath, Furze, Broom, Rushes, or brushwood; and the Irish farmer may frequently find a bed of gravel beneath his surface soil.

I have already stated that Mr. Davis advocates the depth of 4 feet for drains on arable land. In this particular he is not singular, for experience seems to have nearly established that depth as the standard; but he is so in preferring a lesser depth on perpetual pasture or meadow lands. He says, in his "Farming Essays," "Although no one can be more sensible than I am of the importance in draining of going to the depth, in arable land, of at least 4 feet, I am very far from thinking that the reasons for going to this depth which apply to corn are equally applicable to grass; indeed I have latterly been led to think that such deep drainage may be injurious to pastures by depriving them of a cool bottom, on the maintenance of which a continuous growth through the summer depends. I readily admit, for I have seen it is so, that deep drains draw further and raise higher the temperature of the soil, and afford a greater space to the cereal Grasses and legumes to root in, advantages of immense importance to the raising of corn; but with Grass land, when we desire a continuance of succulent vegetation and a succession of plants to rise through July and August, a moist bed is an advantage which I imagine should be preserved with this view, and at the same time that I have been considering the advisability of going deeper than 4 feet in arable land, I have been reducing my drains in pasture to 3 feet, for, while I would free the top surface of all stagnant water, I wish not to place the reservoir of moisture so low that it shall not cool and moisten the surface in the summer, for on having this moisture much valuable pasturage at this dry season depends."

Is there not something in this suggestion? We see that the most luxuriant natural meadows are those in low situations, where moisture is never far from the roots, and some Grasses —for instance, the Agrostis stolonifera (Fiorin Grass)—absolutely require water; but this subject is no doubt very disputable: let scientific men decide it, if they can. It would be desirable to test such points by accurate and repeated experiments. Doubtful questions of this nature ought to be set at rest, when it is easy to do so by practical means. Again, Mr. Davis, though not absolutely so, is peculiar in his opinions regarding the disadvantages of thick sowing. His practice is to sow very thinly after a gradual diminution of the quantity of seed, from 3 and 2½ bushels to 2½ pecks, which he considers sufficient for an acre, if sown in drills 12 inches apart, and horsehoed repeatedly during the growth of the crop. I perceive that an agriculturist in Kent has challenged Mr. Davis in a friendly tone to test the question of thick or thin sowing, by sowing an acre with about 6 gallons of seed Wheat, and a second alongside of it with 12 gallons. Mr. Davis will, no doubt, respond to the challenge. Yet the proposed contest will only ascertain whether a given quantity of seed or double its amount will produce the better crop. The question, "What is the right quantity to be sown?" is another matter, and the answer to this must depend on the natural qualities and preparations of the soil; and its condition as respects the amount of alimentary principles which it contains. Judging by the stubbles which I examined, and the ear of the sheaves in stack, I would say that the produce was more than the ordinary yield where thicker sowing prevails. The Oats I saw uncut were a thick and even crop, from I believe but 2½ pecks per acre. If more seed had been sown there would have been I think a less productive crop. Of Barley I have had no fair opportunity of judging. My own experience is in favour of full seeding for that crop, but that experience has been very limited.

The waste of seed corn is undoubtedly prodigious, and if the economy of seed practised by Mr. Davis, were general, the saving would be vast in a national view. Even a much greater saving than that recommended by the practice of Mr. Davis and other advocates for thin sowing might be effected. I am referring more particularly to the case of Wheat by dibbling, and still more by sowing in seeding beds and transplanting. In the latter case where the limited scale of farming and a redundancy of human labour invites such management, the produce would probably be much greater from single plants placed at suitable distances, than from those raised by dibbling, which no doubt causes a loss of seed, many grains being almost necessarily thrown into each hole; yet the saving even by dibbling in this country, where at least a million

and a half of quarters of Wheat is used for seed, will appear of great moment to any one who chooses to take the trouble of calculating the difference between the quantity of seed sown and that which would be sown under the circumstances to which I am about to advert.

Three months since, I visited a farm in Brittany, within a mile of Dol, on the confines of Normandy, where agriculture is very deficient compared with that of British farmers, and *on that farm, consisting of 200 acres of strong clay, which is* tilled in a manner very superior to ordinary practice, I saw 40 acres of dibbled wheat. The cultivator, who has been in the habit, during 25 years, of dibbling his Wheat, has learnt by experience the importance of increasing the distance between the holes from 12 inches every way to 16 by 18 inches. He sows but 20lbs. of seed to the acre, while many of his neighbours sow 150 lbs., and yet his yield of crop exceeds theirs by one-third on a fair average. The ears of the Wheat so dibbled were very large, whereas those of the corn sown broadcast and closely were very diminutive. His straw, also, was magnificent. His practice is at length spreading in that district, and will probably become the established system there; yet where the quality of the land and superabundance of human labor invite such practice, the produce would probably be still greater from single plants placed at equal distances, and within a few inches of each other, than by either dibbling or drilling, as these operations are usually performed.

Mr. Davis is no advocate for dibbling, by which, "in a wet season the action of the dibbler forms a cup or basin nearly water-tight for the reception of the seed, which must be very *pernicious to its germination, for sown in this way the seed* often lies in water surrounded with a compressed wall, which the infant root has to penetrate, and lies shut in a box alternately too wet and dry, and without mould in immediate contact." He also objects to the method on account of the crowding of five or six grains "upon the space of a sixpence."

I think that the case which I have stated is sufficiently strong to calm any apprehensions of failure from dibbling, although the comparison in that instance has been between very thick broadcast sowing and dibbling, and not between dibbling and drilling, with horsehoeing and weeding, as Mr. Davis sows and manages his Wheat. It is remarkable that Mr. Arthur Young, in 1771, found in the course of his tour through the east of England that the maximum produce of corn was obtained from the minimum of seed sown at that period—thus he attributes his success in raising so many crops in succession from one manuring, to the deep and frequent stirring of the soil, and to his applying manure only to the green or cattle crops, and never to corn, which he thinks would render it more liable to injury from blight, while it would also cause the excessive luxuriance of straw, to the exhaustion of the ground. *I was surprised to see so good a crop* of Beans without manure, and still more to see the Wheat which he obtained in the fifth year after Beans, which had also been grown without any manure.

A Solution for the Steep of the Grain of Cereal Plants.—I beg to recommend the following composition;—

Take of—Muriate of Ammonia (Sal Ammonia,)
Sulphate of Soda (Glauber's Salt,)
Phosphate of Soda,
Nitrate of Potass (Saltpetre,)
Sulphate of Magnesia (Epsom Salts,)
of each 4lbs.

Dissolve the whole of the above salts in 18 gallons of boiling water, and when quite cold, the seeds are to be steeped in the solution 24 hours. If the seeds are not to be used immediately, then they must be thinly spread out upon the floor, and their drying may be hastened by lime dust sprinkled over them. But the sooner they are sown, after having undergone the processes of steeping and drying, the better. On an average, two quarters of wheat may be used for the 18 gallons of solution, or one gallon and a half for every bushel of wheat or barley. Rye, oats, and the inferior cereal grains, do not require so much of the above-named salts to the 18 gallons of water—3lbs. of each salt will get sufficient. A cash is a great object to the small farmer, the chloride of lime may be employed, in the proportion of 2½lbs. to the 4lbs. of the other salts, instead of the phosphate of soda; it is cheaper, and, on the farm of my friend, it has been equally beneficial.—*H. W. D. The Agriculturist.*

Newcastle Farmer.

COBOURG, CANADA WEST, DECEMBER 1, 1848.

It is not with any very plausible anticipations that we look forward on the prospects for the Canadian farmer, who expects to realize more than a fare and decent subsistence for himself and family—the high price of labour—the distance from his market—the expense of freight on all his produce diminishing his profits, while it greatly increases his outlay on all articles imported for his use, and the great probability that his principal article of export will not realize a greater price than at the close of the last harvest, if it reach that. How manufactures from abroad are to be paid for, with so *comparatively* trifling an export of the ordinary staple of the country, is a problem which must soon be solved—and it certainly does appear to us that the attention of the Agriculturist must be turned to the subject of furnishing some other articles of export to the British market than that of Wheat and Flour—articles in which our neighbours of the United States have a decided advantage over us, from their great facilities of communication with the sea, and their much lower freight and insurance, which more than covers all the protection afforded the Colonial farmer, and which protection soon ceases.

We have heard of Pork—Hogs of 200lbs., being purchased for 12s. 6d. per hundred; surely such a traffic as that could be turned to a better account by salting, packing, and exporting direct to England—not one-penny-farthing per pound for that which is at least worth (if in good order as it ought to, and might be) fourpence sterling in any wholesale market in Great Britain. The lard also might be made remunerative, being an article much in demand in the English market. It has been frequentlp suggested that Butter would find a ready market and bring a good price in the English ports, and we believe some quantities of the Canadian article have been sent—with what success we know not—but from the vast amount made at home, and sent in from Ireland, and the large supplies from the Dutch and Belgian dairies, which is less likely to be injured in packing or from the length of the voyage, we should fear that the butter trade would prove an uncertain and hazardous experiment. Cheese at present is out of the question, as from the few manufacturers of the article the supply rarely exceeds the demand for home consumption, and, as such, could not be exported at a profit.

We have our doubts whether Canadian Beef, at its ordinary price, would pay to export, for although the herds of the country are far superior to what they were fifteen or twenty years ago, still the greater portion of them would cut but a sorry figure alongside the description of Beef slaughtered in England. Beef in the carcase is already imported into England from France, Portugal, Holland and Germany, and if at all inferior, only realizes two shillings and six pence for 8lbs., and would at such prices shut the Canadian salted Beef out of the market.

In reference to the remark on the price of Pork, we would notice an article on Pig feeding, which has just met our eye in

the *London Agricultural Gazette*, by which it appears that four Pigs, when slaughtered, after being kept up eleven weeks, during which time they consumed 16 bushels and 2½ pecks of barley meal each, weighed on the average 202lbs., and were sold for £19 3s. 10d. sterling. As it is most probable that it takes as much in quantity to fat a lean hog in Canada as in England, and as the above quantity of barley meal would be worth about thirty-five shillings, it must indeed be sorry work to raise pork to sell at 12s. 6d. per hundred.

From the Dublin Farmer's Gazette.

AN ESSAY ON THE HISTORY OF SHEEP.

BY JACOB THOMPSON DUNNE.

Profane writers who treat of the antediluvian period, whether poets or historians, are, I may say, altogether silent on the subject of sheep; it is, therefore, to the writings of Moses we must look for their early history.

In Genesis iv. 2, we are told "Abel was a keeper of sheep," and in the same chapter, verse 4, we read that he brought the "firstlings of his flock and of the *fat* thereof, as an offering to the Lord." A. M, 129. The Hebrew word translated "*fat*" in this passage rather means *milk*, as we find it rendered in chap. xviii. p. 8, of the same book, and Josephus, an authority respecting the Jews next to the Bible, says "Abel brought the milk of his ewes."—*Jewish History*. In fact, the whole passage means no more than that he offered the milk of his prime ewes to the Lord, for if the *fat* was offered as a sacrifice, we would be led to believe that the remainder of the carcass was eaten; but we have no good authority that animal food was used prior to the deluge,—"Fruits and herbs were the food allowed to man."—See Gen. i. 29, ii. 16. Sheep might certainly have been offered as holocausts, and their skins used as clothing in primitive times. In very early ages in Greece the skins of wild beasts killed in hunting were converted to the same purpose, as we learn from Lucretius, Lib. v, 951—

"Uti
Pellibus et spoliis corpus vestire ferarum."

That *milk* was offered in ancient times, even by heathens to their deities, we have several instances; see Virgil's Fifth Eclogue, line 67, where shepherds speak of offering on their altars bowls of *new milk* to Apollo and Daphnis.

It is after the flood we find meat permitted as the food of man; see Genesis the ninth chapter and third verse, where it says "every moving thing that liveth shall be meat for you." During the golden age man lived on milk, honey, fruit, herbs, &c.

"Men fed on fruit
Nor durst with bloody meals their hands pollute."
See Ovid's Metamorphoses,, Lib. 1st and 15th.

The next account, after Abel's time, that the Scriptures give us of sheep, is where Jubal the son of Adah and Lamech, one of the posterity of Cain, is said to be the first *nomadic shepherd*, or, in the language of holy writ, "the father of such as dwell in tents and have cattle."—Gen. iv. 20. This was about 500 years before the deluge. The covering of these tents was, perhaps, the skins of the sheep that were sacrificed, or a felt made from their wool, which in later times was woven into cloth; for it is hard to say that man, during all that time, which passed prior to the flood, could be ignorant of the uses of the fleece, as they must have remarked its felting properties, and also its capabilities of being drawn into thread, dyed, woven, &c., so I am of opinion that long before the deluge, cloth was manufactured and worn in dress.

After the flood, when animal food was permitted, we ought not to consider that it was generally used; perhaps men partook of it only at their periodical sacrifices, at the new moons, and other festivals, or as a rare luxury on some particular occasions.—See *Wilson's Archæologia*.

A thousand years after the deluge, we learn from *Elian, Var. Hist. Lib. v. c. 14*, that "no one was to kill an ox that laboured at the plough." This mandate was followed in luxurious Greece. Other writers alluding to the same country and period, affirm, that "lambs or oxen under a year old were not killed, nor any living creature hurted or molested."—*See Athenæus*, lib. i, and ix.; *Eustatius in Homer's Iliad; Porphyr de Abstin.; Hieronim. in Jovin.* lib. ii. In fact, the use of meat was slowly, and never universally established, as you may see in *Robin. Archæl. Græca*, pp. 1?8, 496. The flesh of sheep was never generally esteemed; the Spaniards disliked it; the Americans have a prejudice against it; and it is of a late date that it has been prized in Great Britain; the Tartars prefer horse-flesh to it.—See Polignac's account of the Calmucs, and Dr, Parry on the *Merinos*. Pliny (*Secundus,*) lib. viii. c. 47, tells us that sheep were only offered in sacrifice, and that our clothing and coverture were from their fleeces. The prejudice against mutton is very strange, as no meat is more easily digested, or more nourishing, than that of a wether in his prime.—See Brewster's Encyclopædia, art. Aliment. The flesh of a ram or an old ewe, to be sure, is tough and deficient in juice, but what is nicer than roast lamb or good mutton broth? In 1921 B. C., the Bible speaks of the flocks and herds of Abram and Lot.—Gen. xii. 8, 16; xiii. 2, 5, 6, 7, and in chap. xiv. 14, 16, of Abram's servants trained for war. In reading these texts you will see a correct picture of the present shepherds of Tartary and Arabia; and though it is now upwards of 3,700 years since, Palestine was not sufficient to graze the flocks of Abram and Lot together, yet there is very little alteration in the nomadic shepherd's mode of life, as we learn from Chevalier d'Arvieux's Travels in the East. Dyer justly describes them—

"The weary Arabs roam from plain to plain,
Guiding the languid herd in search of food,
And shift their little home's uncertain scene,
With frequent farewell: strangers, pilgrims all,
As were their fathers."
—Dyer's Fleece, Book 1st.

The sheep of Palestine were more prolific than ours, as Sir Thomas Browne remarks in his Miscellaneous Tracts. From several Jewish writers, we are led to believe that their *ewes yeaned twice in the year*—viz., during the months Nisan and Tissi, which correspond with our equinoctial months. This will account, in a great measure, for the numerous flocks so often spoken of in Scripture. Job had 1,400 sheep, exclusive of other stock. When the Israelites entered the Midian territories, they bore away with them 675,000 sheep, besides a vast number of beeves.—See Numbers xxxi. 32. In 1 Chron. v. 21, we read that the tribes of Reuben and Gad, in their war with the Hagarites, obtained a booty of 250,000 sheep. The King of Moab paid an annual tribute of 200,000 sheep; and at the dedication of the Temple, Solomon offered 120,000 sheep. 2 Chron. vii. 5. (N. B.—The male only was eaten.—Gen. xxxi. 38. The paschal lamb was male, and those sacrificed were usually males.) These numerous flocks were not confined to ancient times. Sir J. Chapman, in his travels not many years ago, met a clan of Turcoman shepherds near Aleppo, who, besides other cattle, had more than 300,000 of sheep and goats; and Dr. Shaw speaks of the immense flocks of the Arabs.—See his "Travels," book ii. p. 125. The scarcity of water, and the long-continued droughts in Judea and Arabia often lessened their flocks. We read in *Genesis* xxi. 27—31, of Abraham giving Abimelech, king of the Philistines, seven ewe lambs for a place where he dug a hole. Before the invention of coin, lamb and sheep were given in contracts, the same as money at present. Homer speaks of a cauldron worth twenty sheep, and of a cup worth twelve lambs. Hesiod represents two brothers quarrelling about "the sheep"—that is, the property of their father.—See Hunter's *Sacred Biog.* Abraham. *Pecunia*, the Latin of money, is derived, as Scaligar remarks, from *pecus*, a flock—*Quod veterum divitiæ consistebant in copia pecudis, ita moneta pecudis effigie primum notata fuit.*

The next account we have of sheep in Scripture, is that of Laban at Haran.—Gen. xxix. 1. This was about 100 years after what is mentioned about Abram. Jacob visits his uncle Laban, and finds his cousin Rachel tending her father's sheep, which he assisted her to water, and after that served her father fourteen years for her sake. At the end of that time, when Jacob was about leaving Laban, they came to an agreement, or

contract, that Jacob should receive from Laban, his father-in-law, all the ring streaked and speckled sheep and goats in future, as a reward for his services—the general colour of sheep at that time being *brown* or a *dingy black*. Jacob, from experience, knowing the power of the imagination of the female at the time of her conception, turned it to his advantage, and placing green rods of poplar, hazel, and chestnut, mixed with peeled branches, before the ewes at the rutting time, which usually took place at their watering, in a short time, by these and other like means, he had the majority of the flock "ring-streaked, speckled, and spotted."—See Gen. xxxi. 8, 9. Michaelis, on this passage, asserts, that white cloths, and pure, white stone troughs, in later times, have been used for a similar purpose, and with a similar result.

From the experiments of Jacob we may date the change in the colour of sheep. After he quit Laban, we may judge that he selected the *whitest*, and placed them together. At length, among his descendants, we learn that in the time of David they were as white as snow.—Psalm cxlvii. 16. Solomon, also, in his Canticles, likens his mistress's teeth to a flock of sheep newly washed.—Cant. iv. 2. See "Lucock's Essay on Wool" pp. 30, 31, where he asserts that this improvement in colour soon progressed as far as Arabia, thence to Persia, Syria, and Egypt. In profane history we find, also, a very early account of the "Golden Fleece" of Colchis, and the Argonautic expedition in quest of it. After Jacob's time there is very little said of sheep in the Holy Scriptures, and profane history that can be credited, does not commence for some centuries later.

That the primitive breed were blackish I have already shown; that they also had large horns, is manifest from several passages in the Bible. We read of the "ram caught by his horns in a thicket."—Gen. xxii. 13; and of war trumpets made of rams' horns.—Joshua vi. 6. Polled sheep were only an incidental variety.

From very early dates, two breeds of sheep have inhabited the eastern countries—viz., the long-tailed, with an accumulation of fat round it at the rump, and the other, with a quantity of fat beginning at the loins, and swelling gradually towards the rump, where it formed two large, globular masses. These *fat tailed* and *fat-rumped* were known to the patriarchs, as you may see by Levit. viii. 25, 28, and ix. 14.

From divine and profane records, we learn that young women, as well as men, attended sheep. Dogs, also, attended on them in ancient and modern times. See Job xxx. 1, Isaiah lvi. 9, 11, Psalm xvii. 16; and yet, strange to say, the dog is never spoken of but with contempt in the whole of the sacred volume.

The Jews gave names to their sheep, and called them, as we may learn from John x. 3, 4. We read also of Polyphemus, the first whom profane history records as having flocks, speaking to his ram, and telling him what to do.—See Lucian's Dialog. de Poliyph.

We read, likewise, of the powerful influence which shepherds have over their flocks by means of music. David was a shepherd, and performed so powerfully on the lyre, or harp, that he chased the evil spirit from Saul.—1 Sam. xvi. 14—23.

Orpheus, Pan, and Apollo tended their flocks and were wonderful musicians. Goldsmith in his Animated Nature, vol. 11, p. 59, gives an interesting account of a shepherd musician of the Alps.—See also Murray's summer in the Pyrenees, where he speaks of the shepherds of mount Perdue and Sago; their sheep followed them like hounds, leaping down rocks and declivities, when called or whistled for.

The tenderness and humanity of shepherds is well known, and often spoken of even in the Bible.—See Gen. xxxiii. 13.

The prophet, speaking of the Messiah says, "he shall feed his flock like a shepherd; he shall gather the lambs with his arm and shall carry them in his bosom, and shall gently lead those that are with young." Every shepherd should remember this text and fulfil it; he should also follow the advice of Dyer—

> "In flowery spring-time when the new-dropped lamb,
> Tottering with weakness by its mother's side,
> Feels the fresh world about him and each thorn,
> Hillock, or furrow, trips his feeble feet—
> Oh! guard him carefully!"—Book 1st.

In Nathan's parable, 2 Sam. xii. 1—3, we see the fondness with which the Jews treated their sheep; the poor man's ewe lamb "eat of his own meat, drank of his own cup, and lay in his own bosom and was unto him as a daughter." Bochert gives several instances of their affection to animals.—Olieron y. 1. L. 11. 43.

The shearing of sheep was very early practised among the Jews; 1800 years before the Christian era, Laban went to shear his sheep.—Gen. xxxi. 9, 22, second Kings x. 13, 14, second Sam. xx. iii. 23, 28, Isaiah liii. 7, and Philo Judeus on Creation, chapter 1.

Embroidery also was very early known, as we may gather from Judges v. 20. Homer, speaking of the Greeks about 70 years after Sisera's time, mentions "painted garments," and Pliny says the Phrygians wrought with needles "beautiful trees and flowers on their dress."—Lib. viii., c. 48.

The Babylonish garments were so beautiful in this respect, as to tempt Achan to break the Lord's commandment.—Joshua vii., 21.

CONSUMPTION OF FOOD BY LARGE AND SMALL ANIMALS.

In the last number of the *Journal of the Royal Agricultural Society*, is the following communication from Mr. Geo. Shackel, Reading, on the above subject, with note by the editor, Mr. Pusey:—"I was from home on the arrival of yours, dated 30th September, or I should have answered it earlier.—The lambs which I mentioned to you as having wintered last year were both of the Hampshire breed, 100 in each lot. I will with pleasure repeat what I stated on Wednesday last respecting the feeding and quantity, and also give you an account of the cost of each lot as well as the proceeds of the sale when they were fat. The two lots were fed at the same time on the same food, and penned on the same ground, but were kept separate from the commencement. I allowed each lot when on turnips (because we did not slice the turnips, only the Swedes) the same sized piece per day; and when on Swedes, which we began about Christmas, 33 bushels (sliced) per day, and 18 bushels of excellent clover-chaff to each lot; and on the 20th of Feburary, 1847, we gave them 1lb. of oil-cake a day on an average until they were sold out.

Bought in the last week of October, 1846.

100 very large Hampshire Down lambs cost per head	£2 1 0
100 Hampshire Down lambs, weighing about 1½st less than above, and very much smaller, cost per head	1 15 0
	£0 6 0

The latter was in much better condition than the large ones.

Sold out from 28th March to 20th May, 1847.

100 lambs which cost 41s., sold at Smithfield and Southall markets, realized on an average, with wool	£3 1 3
100 lambs which cost 35s., sold at the same markets, realized on an average, with wool.....	2 9 0
In favour of large lambs	£0 12 3

I ought to add that the markets were about 2s. per head in favour of the large lambs, the trade for mutton being about that difference, or rather more, when the large lambs were sold which would leave 10s. 3d. instead of 12s. 3d. in favour.—Nothing would be more conclusive and satisfactory than a fair trial, in the same manner, between 100 Sussex and 100 of Hampshire Downs, both lots of their breed of equal value; that is to say, 100 of best Sussex against 100 of best Hampshire, kept on the same land, and fairly tested out of doors, as a farmer would wish to winter them. Perhaps you will be able to get a fair trial between the large and small breeds and then publish the result, which would be more satisfactory than mine.

Note by Mr Pusey.—The above trial seemed to me well to deserve a place in the Society's Journal, as throwing light upon the question whether large and small animals of the same race do or do not consume food in proportion to their respective bulk. The question is not merely interesting as a point of physiological science, but also in practical farming. A

large body of farmers defend the Hampshire or West Down sheep, notwithstanding their plain appearance, by saying that this plain breed comes to a greater weight, and therefore makes a greater money return, than the Sussex or true South Down. The breeders of South Downs reply that, if their sheep are smaller, more of them can be kept on the same farm.—Here, then, the abstract question has a practical bearing. Last winter I saw a little Devon beast by the side of a large Hereford preparing for the show of the Smithfield Club, and Mr. Trinder's feeder informed me that the small one ate about as much as his more bulky neighbour. In this second instance there was a very decided difference between Mr. Shackel's two lots, yet the larger lambs were satisfied throughout with an equal allowance of each kind of food; and, though of the same breed, made a better return by 4s. a head than the smaller sheep. This plain fact seems to warrant me in calling the attention of practical men to this point of farming

EXEMPLIFICATIONS OF INSTINCT.

The similarity between the simple instinctive action of animals and their ordinary organic functions is so great as to lead us to suppose that both sets of operations are arranged *upon similar plans though these may not be identical, and* that both are carried on without the forethought or the consciousness of the animal. Thus the young bee on the first day that it leaves the cell, without teaching and without experience, begins to collect honey and form wax, and, build up its hexagonal cell, according to the form which its progenitors have used from the earliest generations. Birds builds nests of a certain structure after their kinds; and many species, at certain seasons, excited by some internal impulse, take their migratory flight to other countries. The insect, which never experienced a parent's care or a mother's example, labours assiduously and effectively for the future development and sustenance of an offspring which it, in its turn, is doomed never to behold. Others toil all summer and lay up stores for winter, without ever having experienced the severity of such a season, or being in any sensible way aware of its approach. We know that such actions are the result of involuntary and unreflective impulses, because we often find them performed in vain. Sir Joseph Banks had a tame beaver which was allowed to range at liberty in a ditch about his grounds, and was at all seasons liberally supplied with food. One day, about the end of autumn, it was discovered in the ditch very busily engaged in attempting to construct a dam after the manner of its companions in a state of nature. This was evidently the blind impulse of its instinctive feelings, for a moment's exercise of the lowest degree of reflection must have shown it that such labour under the circumstances in which it was placed, was altogether superfluous.—A common quail was kept in a cage, and became quite tame and reconciled to its food. At the period of its natural migration it become exceedingly restless and sleepless; it beat its head against the cage in many vain efforts to escape, and on examination its skin was found several degrees above its usual temperature. A bee, which can fly homewards one or two miles in a straight line to its hive, with extreme accuracy, if it happens to enter an open window in a room, will exhaust all its efforts in attempting to get out at the opposite window which is closed down, but never pause, to think of retracing its flight a little way backwards, so as to fly out at the opening at which it had entered. We often observe a dog, when going to sleep on the floor, turn himself several times round before he lies down, and this is just one of the lingering instincts which he has retained; while in his wild state he is accustomed thus to prepare his bed amid the tall grass or rushes. An acute observer of animal habits has remarked that a jackdaw, which, for want of its usual place of abode, had for its nest made choice of a rabbit hole, was often sorely perplexed in what way to get the long sticks, of which its nest was to be formed, drawn within the narrow entrance. Again and again did it attempt to pull in the piece of stick while it held it in the middle in its bill, and it was only after a series of vain efforts that, by mere chance, it at last accomplished its object by happening to seize it near one end instead of the centre. In this case it appeared to the observer that the building instincts of this bird were complete and perfect within a certain range, but without the limits of this circle it had no deliberative foresight to guide its actions.—*British Quarterly.*

Miscellaneous.

LORD PENRHYN'S POULTRY-HOUSE.

The following account of Lord Penrhyn's poultry house is extracted from "*The Poultry-yard*," by Peter Boswell;—"The most magnificent poultry place, perhaps, that ever has been built, is that of Lord Penrhyn's, at Winnington, in Cheshire. It consists of a handsome regular front, extending about 140 feet, at each extremity of which is a neat pavilion with a large arched window. These pavilions are united to the centre of the designs by a colonnade of small cast iron pillars, painted white, which support a cornice, and a slate roof, covering a paved walk, and a variety of different conveniences for the poultry, for keeping eggs, corn, and the like. The doors into these are all of lattice work, also painted white, and the framing green. In the middle of the front are four handsome stone columns, and four pilasters, supporting likewise a cornice and a slate roof, under which and between the columns is a beautiful mosaic iron gate; on one side of this gate is an elegant little parlour, beautifully papered and furnished; and at the other end of the colonnade a very neat kitchen, so excessively clean and in such high order that it is delightful to view. The front is the diameter or chord of a large semicircular court behind, round which there is also a colonnade and a great variety of convenience for poultry. This court is neatly paved, and a circular pond and pump are in the middle of it. The whole fronts towards a rich little paddock, in which the poultry have the liberty to walk about between meals. At one o'clock a boll rings, and the beautiful gate is open. The poultry being then mostly walked in the paddock, and knowing by the sound of the bell that their repast is ready for them, fly and run from all quarters, and rush in at the gate, every one striving which can get the first share in the scramble. There are about 600 poultry of different kinds in the place; and although so large a number, the semicircular court is kept so neat and clean that not a speck of dung is to be seen. This poultry place is built of brick, except the pillars and cornices, the lintels and jambs of the doors and the windows; but the bricks are not seen, being all covered with a remarkable fine kind of slate from his lordship's estates in Wales. These slates are close jointed, and fastened with screw nails or small spars fitted in the nick; they are afterwards painted, and fine white sand thrown on while the paint is wet, which gives the whole the appearance of the most beautiful free-stone.

MODE OF MEASURING HAY STACKS.

The following directions are given by Mr. Bayldon, in his Rents and Tillages, for this process:—"Supposing the stack to be ten yards long at the bottom, and eleven at the eaves; four and a half wide at the bottom, and five and a half at the eaves; and presuming it to be four yards in height to the eaves, and to rise three yards to the point of the roof; in order to find the contents, the dimensions are summed up thus:

Medium length,		10½ yards
Do.	breadth,	5
		52½
Do.	height	5 including ⅓ of the rise of roof.

10)262½ = 26¼ tons, or 29¼ loads.

If the stack swells out considerably towards the eaves, the height—if taken against the side—will appear to be greater than it is in reality; it should therefore be measured by a pole set up perpendicularly to the eaves. When it is required to measure an irregularly formed stack, the contents may be found by giving and taking proportionate quantities of the separate parts, or by measuring or computing it in different divisions. If round, a more complex calculation is necessary, and can be hardly ascertained with accuracy without having recourse to geometry. *Mr. Bayldon, however, mentions* a simple method, which consists in measuring the circumference at the bottom, and at regular distances up to the eaves, which

must be added together, and divided by their joint number for a mean circumference; the square of which must then be multiplied by the decimal .07958, and this product by the height up to the eaves, and one-third of the rise of the roof, added together, and this divided by 27 (the calculation being made in feet) will give the product in decimal yards.

THE CAUSES OF HILL AND DALE.—"The existing inequalities on the surface of the earth, and particularly the origin, the form, and the distribution of valleys, have been the subject of much controversy and very conflicting opinions among geologists. Yet after all allowance has been made for volcanic action, or the formation of islands, hills, and mountains, by the sudden eruption of concentrated, local, subterranean fire, —for plutonic action, or the upheaving of mountain ranges, and the diversified elevating of broad tracts of country, by the power of diffused subterranean fire,—for disruptive action in the crash of the avalanch, the fall of the landslip, and the devastations of the earthquake,—and for diluvial action, in the breaking up of continents, the dispersion of islands, the throwing down of hills, the filling up of hollows, and the general physical revolution of the world by the general deluge,—all classes of geologists admit that a very large amount of the existing contour of the earth, and especially those features and lineaments of it which constitute the ramified basins of great rivers, must have been fashioned by the action of running water. In whatever condition the world was left by the general deluge, whatever effects it retained of the previous great volcanic and plutonic agencies, and whatever results it exhibited of the universal catastrope which had just transpired, it cannot be imagined to have possessed the flowing outlines of valley and the nice adjustments of river-course which now characterize it, but must be figured to the mind as abounding in asperities, rugosities, spreading tableaux, and sharply angular masses, which only the erosions of the atmosphere, and the action of running water, could reduce to the existing condition of beautifully curved surface, and conveniently intricate division."

EXTRAORDINARY ACCIDENT.—On Friday week, as two ladies were riding out in a retired lane at Mattishall Burgh, Norfolk, they observed a cow running towards them in a state of great excitement and apparently mad. On its approach, they discovered a child attached to its tail by the hair, which was wound round its body. They instantly gave the alarm at the nearest house, and assistance being rendered the cow was secured. The child was, however, found to be quite dead. The body was much bruised, and the head cut and battered in a dreadful manner. An inquest was held on the body on Saturday, when it appeared from the evidence of a child five or six years old, who was near the spot at the time of the occurrence, that deceased, (whose name was Thomas Ireson, aged 10 years, son of a labourer residing in the parish,) had tied the cow's tail, which had a great length of hair, round his body, saying that he was going to have a swing, and the cow started off, dragging the deceased after it. A verdict of "Accidental death" was returned.

AWFULLY SUDDEN DEATH FROM THE STING OF A WASP.—On Saturday morning, the 19th instant, one of those awfully sudden dispensations of Providence, occasioning most afflicting bereavement, and as if intended as a further memento of our frail state, took place here. Mr. Robert Haffenden, sen., of the Stream Farm, a very healthy man, and peculiarly so in appearance, who was known for many miles round as a respectable farmer, went, after partaking of a hearty breakfast, into his garden and partook of a ripe plum, in which afterwards proved to be a wasp, which stung him in the throat. He immediately told his daughter he thought he had been stung, and very quickly finding that the swelling of the throat was rapidly increasing and stopping the passage, means were immediately resorted to to procure honey and vinegar as a remedy (some of which he took,) and a medical man was sent for, but so rapid was the effect of the fatal virus, that at about 8 o'clock, or in about three-quarters of an hour it is presumed after the infliction of the wound, and about an hour before medical aid could be procured, Mr. Haffenden fell a corpse near the front gate. *Truly may it be said, "In the midst of life we are in death."* Mr. H. was very highly respected by all within the circle of his acquaintance, and his decease will be sorrowfully felt by all, particularly by those in his employ, and by more than ordinary severity by his whole family. It is a striking coincidence that the deceased was stung by a wasp on the tongue about twelve months ago.

OVINE SAGACITY.—A very remarkable instance of the sagacity of the sheep occurred lately at Ballochmyle Bridge, Mauchline:—A flock of sheep were pasturing in a field adjoining the above bridge, and being pursued by a dog three of them attempted to cross it. As some workmen, however, are still employed about the bridge, they were deterred from this course and sought refuge on the *bottling course* on the outside of it. The bottling, we may state, is about eight feet from the summit of the parapet wall, and projects from the main building about eighteen inches.—It is nearly *round*, the flat space left not being above four inches broad. At the abutments, however, the bottling is fully two feet broad, and not rounded to the same extent. On this the poor sheep entered at one end of the bridge; and, following each other, began their perilous journey. Before they had proceeded far, however, *it was evident they were conscious of danger*; for they lay down occasionally, while their plantive bleating was distinctly heard in the vale below. No one could lend assistance, as by the slightest motion from above, the sheep would doubtless have fallen into the abyss beneath. They continued their course at intervals, now walking slowly, and now lying down. The caution they displayed, however, was most striking; and though their feet were observed occasionally to slip off the outside of the stone, they notwithstanding passed along in safety. Some idea may be formed of their dangerous position when we state that the bottling is nearly 190 feet above the bed of the river, and the distance, from one end of the bridge to the other, about a quarter of a mile.—The time occupied in passing along was three hours; and their transit was watched with the deepest interest. The sheep belonged ot a flesher residing in Catrine.

PRODUCE OF ONE GRAIN.—Mr. Kirtland, of the Cantonment Farm, Greenbush, has left with us a bundle of straws, *the product of a single grain of Multicole rye, the present* season. There 124 stalks, with fair heads. The grain came up last spring, and in consequence of standing by itself, and being later than the fall-sown rye of the same kind, it did not fill well; but the number of stalks indicates an astonishing reproductive power.—*Ibid.*

ANTS AS FOOD.—White ants, or termites, are eaten by various Africans tribes, both raw and boiled; and it is said the Hottentots "get into good condition on this diet." In India, the natives capture great quantities of these insects, which they mix up with flour, producing a kind of pastry which is purchased at a cheap rate by the poorer people. Some of the Africans prepare large quantities of them for food, by parching them in kettles over a slow fire. In this condition they are eaten by handfuls as delicious food. The traveller Smeathman states that he often ate them dressed in this way and found them to be "delicate, nourishing and wholesome, resembling in flavour sugared cream, or sweet-almond paste." In Brazil, the abdomens of yellow ants are of the South American countries, ants are mixed with resin, and eaten as sauce. In Siam ant's eggs are considered a luxury; they are sent to table curried, or rolled in green leaves, mingled with fine slices or shreds of fat pork. In Sweden, ants are distilled along with rye, to give a flavour to the inferior kinds of brandy. Chemists have ascertained that ants secrete a pleasant kind of vinegar, or a peculiar acid called formic acid.—We derive these facts from an article on "Useful Insects and their Products,," in the Scottish Quarterly Journal of Agriculture.

Published by H. JONES RUTTAN, at the Office of "THE COBOURG STAR & NEWCASTLE DISTRICT GAZETTE," on the 1st of every month. TERMS.—2s. 6d. per annum.