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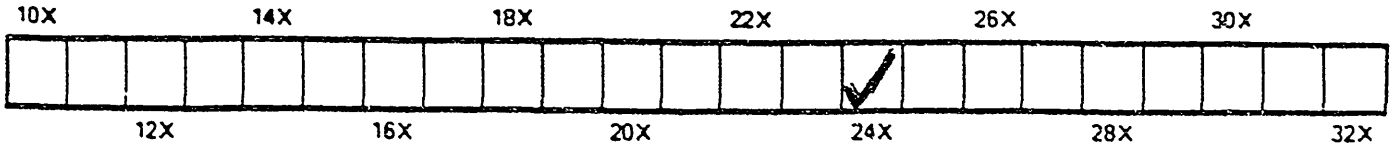


D. Spalding Esqr.

NEWCASTLE FARMER.

VOL. III.—NO. I. COBOURG, SEPTEMBER 1, 1848. THOS. PAGE,—Editor.

BLIGHTS OF THE WHEAT.

CHAPTER VIII.

The good providence of God has supplied most remarkable antidotes to the overwhelming increase of what would otherwise be the ruinously destructive hosts of the insects that prey upon the corn, which he has given for the sustenance of man. Science and art have suggested other remedies. It is proposed in this chapter to describe them, for the comfort and benefit of the agriculturist. We derive great advantages from the insect portions of creation, both direct and indirect. Many necessaries, and even luxuries, come to us from these minute sources, and like the fungi, in consuming decomposing matter, they avert the dangers of numerous fatal diseases that would otherwise approach us on the wings of every breath. On the other hand, their encroachments, as in the instances of the wheat-midge, and Hessian fly, fill us with alarms, and threaten the destruction of our harvests. But all things are wonderfully regulated by Him who holds in his hands the balances of nature, though the modes of their adjustment are often hidden from common view, and, to be known, require, like the treasures of spiritual truth, careful research. We have seen what might be apprehended from the wheat-midge in this country, if it multiplied unchecked; nor are persons in general aware of the marvellous antagonism provided against such disasters. Till the entomologist discovered the wonderful habits of a peculiar tribe of insects, called by the common name *ichneumon*, the existence of such a check on the minute devastators of our crops was totally unknown. Ichneumons, so called, are the instruments of this benefit. The term ichneumon has been applied to them, because they are as valuable in their operations for the destruction of insect pests, as the animals so designated are in devouring the eggs of crocodiles and serpents, in the regions where they are the terror of the inhabitants. The little ichneumons of the insect world do as great service as the ichneumons of Africa, which prevent the dangerous creatures just mentioned from becoming so numerous as to occupy the countries where they abound to the exclusion of other animals, and their own misery from want of food.

In order to understand how the curious insects about to be noticed stay the encroachment of our little midges, a few observations are necessary on their general habits. Their peculiar instinct is to lay their eggs in other living insects, mostly when they are in the larva state. Sometimes they oviposit in chrysalides, and occasionally in eggs; but never, it is believed, in any insect while in a perfect condition. The object of their eggs being thus laid is, that they may under these circumstances, which are favourable to their nature, hatch into grubs. These grubs or maggots soon commence attacking the living substances in which they were placed, and ultimately destroy them. The instinct of these extraordinary creatures leads them to the most complete regulation of the number of their eggs by the size of the victim in each case, and that of the larvæ to which they are to give birth. Sometimes they lay a single egg where there is only enough for the support of its grub, but the numbers vary from one to a large quantity. There is scarcely an insect in existence that is not more or less subject to this species of attack; and the ichneumons themselves vary in size according to the dimensions of the bodies on which they are destined to prey. "Some," says Mr. Kirby, "are so inconceivably small, that the egg of a butterfly, not bigger than a pin's head, is of sufficient magnitude to nourish two of them to maturity; others so large, that the body of a full-grown caterpillar is not more than enough for one." It is not the ichneumon itself, but its larva, or maggot, which destroys such quantities of insects. The ichneumon is a fly with four wings, whose food is honey, and the female seems to live only for the purpose of depositing eggs in the way mentioned. "In search of this," we are told by the entomologist just alluded to, "she is in constant motion. Is the caterpillar of a butterfly or moth, the appropriate food for her young; you see her alight upon the plants where they are most usually to be met with, run quickly over them, carefully examining every leaf, and, having found the unfortunate object of her search, insert her sting into its flesh, and there deposit an egg. In vain her victim, as if conscious of its fate, writhes its body, spits out an acid fluid, menaces with its tentacula, or brings into action the other organs of defence with which it is provided: the active ichneumon braves every danger, and does not desist till her courage and address have insured subsistence for one of her future progeny. Perhaps, however, she discovers, by a sense, the existence of which we perceive, though we have no conception of its nature, that she has been forestalled by some precursor of her own tribe that has already buried an egg in the caterpillar she is examining. In this case she leaves it, aware that it would not suffice for the support of two, and proceeds in search of some other yet unoccupied." Such are the singular habits of these creatures, thus aptly described. All these processes are, as might be expected, varied according to the number of eggs that may be placed with a hope of safe existence in any one body. As soon as these eggs are hatched, the young maggots revel in the feast the body of their victim provides, while the supply of food in every instance is regulated with an inconceivable precision, so as just to last these young ichneumons till they have grown to a size to do without it. Then the grub or caterpillar on which they have existed dies, or, perhaps, just retains sufficient vital power to turn into a chrysalis; which at last does not give birth to a moth, butterfly, or any other fly proper to it, but to several full-grown ichneumons, whose larvæ have become pupæ within this case. The author, not many years ago, had a chrysalis which disclosed, at the proper time, no less than seventeen ichneumons, instead of a large moth which he had expected to see emerge from it. Instinct, we are told upon high authority, is a propensity prior to experience, and independent of instruction. *It is verified in those strange operations. The little* maggot which springs from the egg of the ichneumon goes on eating up its prey, devouring every part of it except the vital organs, which it never touches, as if it knew instinctively that the death of its victim would involve its own entire destruction by famine. Some ichneumons only glue their eggs to the bodies of certain larvæ, because their maggots are provided with instruments for piercing the skins. Others, like the cuckoo among birds, lay their eggs in the nests of insects, which hatch them to devour their own young. Bees are particularly subject to such insidious enemies. No concealment, unless perhaps under water, seems sufficient to baffle the ichneumon, and nothing can surpass its perseverence until its eggs are safely placed in the conditions suitable to its progeny.

Great indeed are their services to mankind, in preventing the injuries of the insects which prey upon our corn. "In vain," to use the words of the able naturalist from whose writings quotations have been previously given, "does the destructive cecidomyia of the wheat conceal its larvæ within the glumes that so closely covers the grain. Three species of these minute benefactors of our race, sent in mercy by Hea-

ven, know how to introduce their eggs into them, thus preventing the mischief they would otherwise occasion, and saving mankind from the horrors of famine." It would be foreign to the purposes of a popular little book like the present, to enter into the entomological details of the formation and habits of these creatures. A general view of their operations will be quite enough. The most common of them is a small fly, like all the rest, of the hymenopterous order. It was originally called *ichneumon tipulæ*, but now goes by the name of the *platygaster tipulæ*. A most accurate description, and a drawing of this fly, may be found in the interesting papers of Mr. Curtis, adverted to in a previous part of this volume. The male is black, and the female is of a pitchy colour. Both shine very much; the former is difficult to meet with. Superficial observers, who have noticed the larvæ of the wheat-midge in the ears, have mistaken the ichneumon, which they have observed amongst them, for the parent of these larvæ, and have consequently condemned it as the origin of the very ills it is destined to diminish. This affords another instance of the folly of hasty conclusions, and of the false reasoning relative to the inferences people deduce without accurate investigation, when they merely see two things together. Just in the same way some farmers have concluded that the little ichneumon flies we are now noticing must lay the eggs producing the larvæ of the midge, because they have themselves seen them amongst the corn containing these larvæ. It is time for all observers to arrive at a better state of knowledge, lest we destroy, as authors of mischiefs, the friendly antidotes to their increase. Prejudice and hasty judgment lead to perpetual misconstructions, as to things both moral and natural.

But to return to the ichneumon. This little platygaster may be readily found on the glumes of the wheat-plants, in the months of July and August. It runs rapidly over the ears, and seems to know well which are those occupied by the larvæ of the midge. The author found numbers of them in various wheat fields in August, 1845; and almost invariably, on examining the ears on which they appeared, discovered that they contained the objects of their search. The ichneumon hunts for them with the utmost eagerness, and by the aid of a sharp tail places a single egg in each of their bodies. The sight has been witnessed by the following experiment: a number of larvæ of the wheat-midge were put upon a piece of white paper, pretty near each other, and an ichneumon was dropped into the midst of the group. The energy of her manner, the rapid vibrations of her antennæ, and the whole of her attitudes, were most amusing. On approaching one of the larvæ her agitation quickened to the utmost intensity; she soon bent her body in a slanting direction beneath her breast, applied her tail to the larvæ, and, becoming still as death, sent forth her curious sheath and deposited her egg in the victim, which writhed considerably under the operation. If she came to one that had previously an egg in it, she left it in an instant and sought another: for the platygaster lays but one in each. This however, often repeated, destroys a great many of these little devastators of the grain. The observations of professor Henslow confirm those which have been already made. He says, "When these eggs are hatched, the young maggots which they produce, and which are the caterpillars of the ichneumons, feed upon the fleshy or muscular parts of the caterpillar they are attacking, carefully avoiding the vital parts. At length the caterpillar, they have been thus devouring alive, dies; or, as frequently happens, it changes to the state of a chrysalis before it is destroyed. The ichneumon caterpillars also pass to the chrysalis state, and either remain within the body of the dead caterpillar, or come out before they assume the fly state. Each species of ichneumon is restricted in its attacks to one, or at most to a few particular species of caterpillar; and the females instinctively proportion the number of eggs they deposit in each individual to the relative size of their own offspring, and that of the insect on which they are destined to prey." It is impossible to contemplate these habits of the minute insects thus brought before our notice, without being deeply impressed with the omnipresence of the great Being to whom all things owe their existence. The same hand that spread the north over the empty space, and suspended the earth upon nothing, and keeps the stars in their courses, regulates the numbers, instincts, and uses of the smallest living things, appearing equally perfect in all:

"What less than wonders from the Wonderful,
What less than miracles from God can flow?"

The two other ichneumons mentioned by Mr. Kirby are supposed to limit the increase of the platygaster tipulæ. One of them is said to oviposit in its eggs, the other in its maggots. There are also many other species, opening a wide and curious field of enquiry for the entomologist. Several very interesting drawings of those alluded to here are given by Mr. Curtis, in the paper previously recommended to the reader's careful perusal. One of these extraordinary flies has an ovipositor, nearly thrice its own length, which it inserts into the parts of the flower containing the eggs in which it designs to lay its own. Indeed the instruments with which nature has furnished all the ichneumons that have been observed, manifest the most remarkable adaptation; and there could scarcely be conceived a more beautiful subject for a separate treatise than that of their forms and habits, whenever they may have been sufficiently investigated. The design of the present remarks is merely to show how carefully there is provided, by the goodness and wisdom of God, a natural antagonism to the disasters that would befall mankind from the unchecked multiplication of our insect enemies. Nor do the ichneumons alone perform this office. There are flies which live upon the midges, carrying them off and devouring them in the same way as hawks and other birds of prey diminish the numbers of the smaller feathered tribes. While this agency is going on in nature, there is left abundance of scope for the exercise of our own ingenuity; and the next question is, how we may effectually call it forth in the way of defence against the little pests now under review?

The author has before stated, that he could not succeed in breeding the midges from the larvæ found in the chaff dust of the barn, and that some of the larvæ have been known to enter the earth. There is, perhaps, reason to believe that it may ultimately be distinctly ascertained that the chrysalis condition is assumed in the earth. If so, those persons who throw this dust carelessly, as is the constant habit, into the farm-yard, help the increase of the fly. The best method of preventing the multiplication of this destructive insect, seems to be that suggested by professor Henslow. He advises the farmers to get sieves made of such a construction that the chaff may be saved, and the dust containing the larvæ pass through. This dust may be destroyed by burning, and with it the larvæ themselves.

The writer has reason to believe that the efficacy of this mode is more than conjectural. In the autumn of 1845, the larvæ of the midge were extremely numerous in the district in which he resides, and several farms suffered considerably. Two intelligent farmers had adopted the precaution of the sieve on large occupations. There were scarcely any midges to be found in their wheat, while in other neighbouring places they were extremely abundant. This simple precaution might have saved many persons, in certain years, a large portion of their crop.

With regard to the Hessian fly, the advice given by Mr. Curtis is manifestly the best possible. It is well worthy the attention of the agriculturists in America. Nothing can be more simple. He merely recommends them to collect and burn the stubble in the fields where they have been found; and the reason given is, that the larvæ at the base of the straw will of course be destroyed. The burnt straw will also form excellent manure for the land; and thus a double advantage will be gained.

The fungi and insects that have been described in the preceding pages form the principal parasites of our wheat-plants. Two more chapters will be devoted to some general remarks on certain matters, evidently connected with these inquiries, and tending, it is trusted, to beget further investigations. It is almost impossible to avoid, in such explanations, that kind of phraseology which, from its technicality, appears at first un-

inviting, and a knowledge of which is assumed in the books and papers of the learned. Men of science have been frequently more mindful of their own reputation, than of the instruction of the ignorant. Still they ought to descend no farther than is needful to raise the latter up to the proper elevation for useful inquiry, by blending together instructive facts and clear explanation. May it also ever be their desire to point to the grand moral lessons taught by physical facts, and to show that the most striking marvels tend to make us more and more in believing confidence in "Him in whom we live, and move, and have our being!" Thus the exercise of our faculties will quicken our faith,—and

"Faith is not reason's labour,—but repose."

ON THE RELATIVE MERITS OF GOOD, BAD, AND PARSIMONIOUS FARMING.

After making a few prefaratory remarks, Mr. Stephenson said, 'I shall proceed to shew what I consider constitutes good, bad, and parsimonious farming, and as my subject divides itself into three heads, I shall briefly make a few plain remarks upon each in succession.

'*First.*—A good practical Farmer commences his work in a methodical manner, having all his plans arranged long before operations are begun. In autumn his first attention is directed towards the sowing of his seed, and advantage is immediately taken afterwards to the storing of his turnips; so that his cattle which are feeding may have their food sweet and good, at stated times, which he considers of the utmost importance towards their improvement; and also that they are plentifully supplied with straw to keep them warm and comfortable. He also thinks it necessary to take some pains in classing them according to their different ages and size. During the autumn the land intended for green crops and spring sowing is effectually ploughed, letting it remain exposed all winter to the frost. When the weather sets in stormy, the thoughtful Farmer is busily employed in collecting and carting manure to the most advantageous situations on the farm, to remain until applied to the land; also repairing roads, leading tiles for draining, &c.; he, therefore, always has plenty of work for his establishment. When the spring arrives and the weather proves favourable, he can proceed without being obliged to do work which ought to have been done in the winter months. After getting all his spring corn sown, his attention is next directed towards his green crops, but he is careful not to turn the winter-ploughed land over until properly dry, which afterwards he finds no difficulty in getting prepared. During the summer months he still goes forward with the same spirit and energy; nothing escapes his notice, and his mind is constantly engaged; he rises early, has all his servants ready at the appointed time, to commence their different operations, such as working his fallows, cleaning his turnips and potatoes, &c.; and when the hay harvest arrives, not a moment is lost to make it secure, because he considers it the most precarious crop he has to manage, particularly if it be grown to any extent. In addition to his ploughmen, he considers it will require for every two pair of horses one spademan and four women, to enable him to carry on the summer work with activity and success. The harvest is now approaching, and in order that the necessary preparations should be made, he first calculates how many labourers it will require to reap his corn in a proper time; and, secondly, insists upon having it cut low, by which he is enabled to procure a greater quantity of straw for making manure during the winter. His stack-yard also is neatly finished—in general a sure emblem of a good Farmer. Then, take a survey round the farm, and you will find it in proper order—hedges neatly trimmed, not occupying twice the ground necessary; all water-courses attended to, gates well hung and fastened, so that his cattle cannot take a ramble through the fields when they choose; all his implements of husbandry are kept in good repair and in their proper place. With such attention and care we cannot wonder, then, that he is successful; for you may be sure if small things are attended to, then greater and more important will not be neglected. Having thus finished his year's labour, he is enabled to look upon it with pleasure, because he is satisfied that by his judicious arrangements his farm is still improving, and he calculates that the value of his crops and the profit arising from his cattle are inducements for him to continue on with all the energy and perseverence he has hitherto exerted.

'*Secondly*—Bad farming—I am sorry to say that kind of farming is too often seen. A bad Farmer cares not how or what way his land is cultivated. His work is always behind hand, and gone through without any regard to neatness or regularity. If I were to give you a minute description of his whole year's employment, it would occupy too much of your time, and I shall therefore merely glance at his different movements. During the autumn and winter months, instead of finding him engaged in making proper preparation for the spring work, he will probably have his horses running out to grass, saving a few bolls of oats; and his ploughmen employed at work which ought to be done by spademen, thereby neglecting what is more essential to be done by his draughts. His young cattle are wandering in all directions over the farm, and those intended for feeding make little improvement, owing to the bad system of not supplying them regularly with food. He makes no preparation for the preservation of the turnips, they are left exposed all winter, and only taken up when wanted, which, in a wet season, proves very injurious to the following crops. The corn he sends to market is generally in bad condition, being full of weeds, which considerably depreciates its value. The seed sown in the spring is done without any regard to the peculiarities of the soil. His horses are low in condition, and consequently unable to perform their work in an efficient manner. The servants, finding their master neither economical or industrious, invariably fall into the same indolent habits. The summer work is not better managed; his green crops are all overgrown with weeds; his hay is considerably injured, owing to want of proper attention; the fallows are neglected in their ploughing and cleaning; the few quickens gathered are most likely thrown into the fence, or perhaps stopping the water course, which, being without a sufficient outlet, overruns the land and seriously damages the crop. The harvest is got through in the same indolent manner, without due respect to management, or saving of expense; wasting the corn, and leaving a great portion of the straw on the ground. Then, as for its stack-yard, it will not bear inspection, exhibiting in it the same sample of slovenliness and waste. The seed time approaches, the land is unprepared, the weather may set in wet, and in consequence the seed is improperly put in; it cannot be a matter of surprise that by such management the produce of the land should not be sufficient to pay the rent and cover all expenses. For, in a few years, his capital is gone, and he is obliged to leave his farm, where, with proper industry and skill, he might have remained.

'*Thirdly*—Parsimonious farming.—This does not consist entirely in that slovenly and careless style I have been describing, but rather in a niggardly and covetous disposition; such as when a man, as the old proverb says, 'Stoops at a straw and throws away a fold.' Although a character of this description may be perfectly acquainted with his business, yet his narrow and selfish disposition, working upon his fears, will not allow him to expend one farthing beyond what he supposes is barely sufficient for the operations of the farm, because, he thinks, if he should, he would never see it again. His establishment is in full keeping with his principle, being scantily provided with both men and horses to work the farm; and he never employs an extra hand, without absolute necessity. The general routine of the farm is also carried on in a similar manner to the bad Farmer, only he is decidedly more careful. His autumn work is attended to; turnips partially secured; his cattle, when brought to market are not fat, because they have been too sparingly fed; during the winter he collects what manure he can upon the farm, but never thinks of purchasing any; when the spring arrives his land is in readiness to receive the seed at the proper time, and the same may be said of his green crops, but in consequence of the limited quantity of manure, the produce proves scanty; his hay crop is deficient from the same cause, and often injured by being too long ex-

posed to the weather; his corn is allowed to stand uncut after it is ripe, as he calculates upon having the reapers at a lower rate, by waiting until others are done—in the meantime, either a wind comes and shakes out a great portion of the grain, or the weather sets in wet, and much of it is spoiled, and when at length it is brought into the yard he neglects to secure it, lest he should be at too great an expense; and, lastly, when thrashing his corn, he is astonished at the smallness of its yield, forgetting that the land had not been properly cultivated; thus, at the end of the year the parsimonious Farmer finds himself in no better circumstance than when he commenced, merely getting a living, but nothing to spare, for all his time and labour. In thus briefly touching upon the last division of this paper, I regret to add that I am acquainted with several respectable Farmers who are so thoroughly in love with the old system of management (a system which I am glad to say is daily tottering on its base), that not all the arguments you can bring forward, together with the various improvements and successful results in modern Agriculture, will induce them to alter their habits or adopt methods that would not only promote the true interests of both themselves and landlords, but would teach them the well-known adage, that 'to reap plentifully, they must sow plentifully.' So long, however, as they cleave to their antiquated notions of farming, I give up all hope of seeing them out of the list of parsimonious Farmers, and must look forward to the rising generation to obliterate the name from amongst us.'

Having thus described the three different modes of farming, Mr. S. proceeds to prove the matter more fully by presenting two tables, shewing different results between good and bad farming upon a farm of 300 acres, allowing 60 acres to be old grass land, and 240 acres arable, and upon the fourth and fifth-course system. In this way he shews a profit of £181 7s. annually towards the good Farmer, and a total loss of £47 annually towards the bad one. 'Thus, in the course of 21 years the good Farmer, allowing him to have his living out of his farm, will be in possession of at least £5,000, including his capital, while the bad Farmer will be reduced to poverty. One great drawback, however, to good farming, is the want of sufficient capital. I would, therefore, advise no man to embark upon a farm larger than his circumstances will warrant. He ought always to remember that a small farm, well managed, will remunerate him better than a large farm, neglected. The manufacturer and tradesman have great advantages over the Agriculturist, have a much quicker and larger return upon their capital; but I see no reason why the Farmer should not be equally recompensed, for he has a more laborious life. When I first commenced my career as a Farmer, 24 years ago, upon a 21 years' lease, I made up my mind to farm well, in every sense of the word, sparing neither expense nor labour. My farms were completely exhausted by the previous tenants taking every advantage, which, however, proved nothing to their interest. It therefore required upwards of 8 years to bring the land into what might be termed a proper state of cultivation to compensate me for the capital expended. I have annually bought 20s. worth of manure for every acre of fallow, independent of what was made upon the farm. This clearly shews the advantage of land being let on lease, for, with few exceptions, no man will be willing to expend his money and labour upon an uncertainty; for when he receives encouragement it stimulates him to improvement. Should, however, farms as I have described be offered to the public, they may probably bring a high rent for a few years; but the landlord, in such cases, ought to be cautious in choosing his tenant, for indifferent Farmers generally offer the most rent, and such farms falling into the hands of tenants of this description would soon be reduced to their former state, and require the same time and expense to bring them round, besides being let at a considerable lower rate. I am aware that several Farmers are so circumstanced, that they cannot make the improvements they otherwise would, were they differently situated. For instance, their landlords may be unwilling to build them suitable offices, and thus they are prevented from consuming their straw and turnips upon the farm, and obliged to send them a distance of several miles to market: in this district several respectable Farmers have not sufficient accommodation for half the quantity of cattle they ought to keep. Again, their farms may be composed of soil that, in its present state, will not repay them for expensive cultivation, and as such, if land must necessarily be occupied, it ought to be improved; and if thoroughly drained, and properly cultivated, it might be made to produce nearly a third more corn. This cannot be done alone by the tenant, but he must necessarily be assisted liberally by the landlord. It is my firm opinion that the time is not far distant when land of this description, if still neglected, will not find a tenant; and when the proprietor becomes the occupier, I need not say what will be the amount of his rent-roll.

'In thus concluding my imperfect remarks upon this important subject, from observations founded on my own personal experience, and knowing, as I do, that the profession of an Agriculturist is precarious and full of risk, I would simply say to all, both good, bad, and parsimonious Farmers, that my principal object in bringing this subject before the club, is to endeavour to instil a more active and liberal spirit of industry and enterprise amongst us, in order that we may keep pace with the ever onward march of improvement progressing in every branch of the national economy, so that at least Agriculture may maintain the position to which its great importance entitles it.'—*Scottish Farmer.*

From the Gardeners' Chronicle

BEES.

The curious habits and economy of the solitary or Mason Wasps are well known, but the apiarian is not aware, I believe, that one of them, named Odynerus parietinus, is a very formidable enemy in the hive, and exercises a very baneful effect upon the society of bees where it intrudes itself. This I first learned last September, when a friend in Suffolk, who has had a good stock of bees for some years, informed me that one of his hives was so infested with insects that it was worthless. On examining the inside a large number of cases, composed of earth and grains of sand, were sticking to the bottom; their forms were irregular, and they looked exactly like lumps of earth (fig. 1); but on opening them I found the inside lined with a glutinous substance, of a shining dull white tint, and no doubt impervious to air or water. Within these cells were fleshy larvæ of a yellow colour (2), composed of 13 segments tapering to the head, which was small, horny, and ochreous, the mouth being armed with little jaws; the neck was bent, the body inflated, and the tail conical (3): these lived through the winter, and changing to pupæ they produced 13 wasps of both sexes at the end of May and beginning of June.

The solitary-wasps were included by Linnæus and Fabricius in the genus Vespa, but Latreille and all recent authors, have named this group Odynerus, which is justified by their dissimilar economy as well as by differences in the form of the mouth.* The male (4), is five or six lines long, black, punctured, and downy; the head has two lateral compound eyes, and on the crown are three minute simple ones in a triangle; the nose, upper lip, and outside of the jaws are bright yellow, as well as a dot between the horns, which are slightly clubbed and composed of 13 joints; the basal one is yellow beneath, and the remainder are orange on the under side, the tip forming a claw (5): the body is shining black, ovate-conic and 7-jointed, the basal joint is like a short bell, the edges having a

* Curtis's Brit. Ent., pl. 137 and 760, where both genera are figured with dissections.

broad yellow margin, lobed on each side, the following segments are edged with yellow, forming bands: the four wings, folded in longitudinal plaits when at rest, are smoky, with a brown stigma and pitchy nervures: the legs are bright yellow, the thighs black, except at the tips, and the four anterior are yellow on the inside: the coxæ also exhibit six yellow spots, and the intermediate shanks have a short black line inside; the feet, which have an orange tinge, are dusky at their extremities, excepting the anterior pair. The female is larger, being 6½ lines long, and the wings expand 1 inch; it differs considerably from the male in the yellow markings: the head is entirely black, excepting the yellow dot between the horns, a stripe on each side the nose, a spot at the base of each jaw, and dot behind each of the lateral eyes: the tips of the horns, which are 12 jointed are not hooked; the front of the collar is yellow, as well as the scapulars, and two spots on the scutel; the body is 6-jointed and armed with a sting, the first joint is yellow, excepting the base, with a lobe in the centre, more or less broad; the coxæ and thighs are black, the tips of the latter yellow; all the shanks have a black stripe inside the apex; the tarsi are brown, terminal joints ferruginous (6). I have been thus particular in identifying both sexes, because there are about 20 species of Odyneri that inhabit England, and it will be very desirable to ascertain if any of the others are equally offensive to bees.

The common wasps, which are social, it is scarcely necessary to observe, form combs of woody fibres, considerably resembling the honeycomb of bees in structure, and like that tribe also the nest comprises three sexes, male, female, and neuters or workers. The solitary-wasps, on the contrary, live secluded, viz., a female forms a certain number of irregular cells, without the presence of males or the assistance of neuters. The various species of Odyneri* select very dissimilar localities for their nests; some burrow into sandy banks, where they construct cells, the entrance to which is a filigree tunnel ingeniously modelled of grains of sand, so loosely united that it falls to pieces on the slightest touch, and of course precludes the entrance of any larger or more careless visitor than the artful architect; others enter our houses and take possession of undisturbed books and papers, seeming to delight in appropriating to themselves the neglected volumes. I have seen the spaces between the heads of several bound books, with one laid over the top, pretty well filled with the muddy cocoons, and sheets of folded paper are equally applicable to their wants.

In each cell the female deposits an egg, and then carries and stores up with it flies and caterpillars of small moths, as well as other larvæ, for the maggots to feed upon when the eggs hatch. Sufficient provision having been thus provided by the industrious mother, the cell is closed, and she proceeds to the structure of another, to be similarly furnished, and thus she prosecutes her labours, probably for several weeks in June, July, and August, whilst the idle males are revelling amongst the farina of flowers. It is the opinion of some authors that the solitary-wasps supply their young with pollen, and the O. parietinus taking up its abode in a beehive would induce one to suspect it was for the purpose of robbing the bees to feed their brood, but I observed imbedded in the earthy cases several pupæ of flies (7); now whether the full grown maggots were brought by the wasps into the cells from which they escaped, or whether the caterpillars had been inoculated by Muscidæ, which had crawled forth and become pupæ outside, so that when the flies hatched they might be at liberty, it is difficult to determine; indeed there is a great deal yet to be learnt, and a complete history of this solitary-wasp alone would fill a volume.

In this, as in similar cases, the mischief may be traced to a want of knowledge and attention. The solitary-wasp when known should be watched for and captured in a pair of forceps on her return to the hive. Old garden walls, with a warm aspect especially, must be kept in repair and well pointed, as old nail holes and chinks are amongst the favourite spots which mason-wasps select to build in and multiply, and where such good accommodation is afforded, they are sure to establish themselves.—*Ruricola.*

* Curtis's Guide, genus 695.

From the Gardeners' Chronicle.

ENTOMOLOGY.

The Jerusalem Artichoke Aphis.

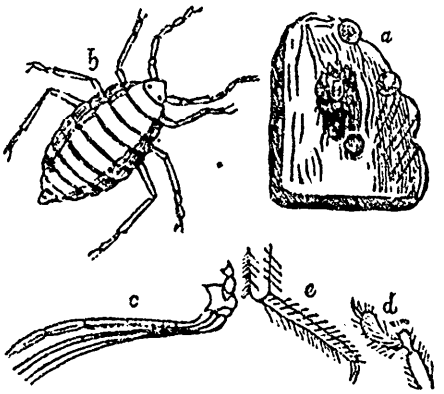
It is surprising that notwithstanding all the suggestions which have been made for substituting some vegetable in lieu of the Potato for the consumption of the lower classes, so little advance has been made in rendering general the use of such plants of easy growth as the Parsnip, Beet-root, and Jerusalem Artichoke. The last of these vegetables is even easier of cultivation than the Potato, and when properly cooked, either boiled or roasted, is relishing and nutritious. Another great advantage which it possesses to a greater degree even than the Potato, is its comparative freedom from insect enemies. The strong growth of the leaves and stem seems to defy their attacks, and it is very rarely indeed that any damage is caused by insects to the roots; in fact, the only insect which we have hitherto found peculiar to the plant is the Aphideous insect represented in the accompanying woodcut.

Among the many singularities presented by the different species of plant lice (Aphidæ) which render their examination and investigation very worthy of the lover of Nature, there is one which has been but little noticed, namely, that several of the species live underground; these species being, as might indeed be imagined from their pecular habits, destitute of wings, which would of course be useless to them in their underground retreats. Several of these species have been described by continental authors, and have been formed, from their structural peculiarities, into different genera, such as Forda, Trama, Paracletus, and Rhizobius. Several of the species of which these genera are composed are found in the nests of different species of ants, the fondness of which for the saccharine matter discharged by the aphides is well known; but some at least of these underground species do not possess saccharine tubercles, so that it is unknown for what purpose they occur in the ants' nests, or what can be the nature of their food, as it does not appear probable that they can obtain nourishment from the particles of vegetables laid up in store by the ants, either for provender or the construction of their nests.

The species before us, however, confines itself to the surface of the tuber of the Jerusalem Artichoke, thrusting its long proboscis into its substances, and thereby obtaining its supply of food. We have found these insects in the middle of winter on digging up the tubers of this plant, generally secreting themselves in the crevices formed by the juxta-position of two or more of the tubers. Here they are to be found in small societies, consisting of one or two large individuals (females) and a few smaller and more slender ones (young). Our figure *a* represents one of these little communities upon a portion of a tuber. Of course were they to occur in great numbers they would deteriorate the quality of the vegetable, but we have seldom found above two or three dozen upon some of the scattered tubers.

The full-grown insect is opake white, with a buffish tinge, finely senceous and setose; the head and first segment of the body with a slightly greyish-brown tinge, and the legs and antennæ of a light buffish brown. Fig. *b* represents a full-grown female magnified. The antennæ are moderately long, and apparently six-jointed, the third joint being the longest; under a powerful lens the extremity of the sixth joint exhibits some traces of articulation. The mouth is constructed in the same manner as that of all the Aphidæ, and other homopterous and hemipterous insects. This is important to be determined; for the Aphidæ differ in so many respects from Cimex and Cicada, the types of these two sub-orders of insects, that they have even been formed by some recent French authors into a distinct order; and several authors (Messrs. Curtis and A. Smee) have described the mouth of the Aphidæ as only furnished with three setæ, one of which would represent the

tongue, and the two others the mandibles or maxillæ, whereas the upper lip is distinct and pointed, and, by careful manipulation, four setæ are found inclosed within the four-jointed rostrum, thereby proving these insects to possess the representatives of the two mandibles and two maxillæ; two of these setæ are more slender than the other pair. Our fig. *c* represents the head (with the two basal joints of the antennæ), the four-jointed proboscis, channelled beneath; the four setæ detached at the extremity of the first joint of the proboscis, and the short pointed upper lip, which is here horizontal and carried downwards. The four anterior legs offer nothing peculiar; their tarsi are two jointed (fig. *d*), but the two hind legs are inserted quite at the sides of the body; they are long, with a long tarsus composed of a single joint (fig. *e*), armed at its extremity with two hooks. The peculiar lateral insertion of this pair of legs enables the insect to throw them upwards, backwards, and forwards, in the same manner as a Dytiscus throws its hind legs about. We observed that they used these hind legs as feelers. The abdomen is destitute of the saccharine tube of the winged species of the family.



This insect enters into Burmeister's genus Rhizobius, and possibly into that of Trama of Van Heyden; but, as Kaltenbach describes the latter as having the antennæ short and apparently seven-jointed, we have retained the insect in the former genus, and have named it specifically Rhizobius Helianthemi. (Proceed. Entomol. Soc., January, 1843, Ann. Nat. Hist., xiv. 453.) It has been suggested (Reports of Zoology, Ray Club, 1844, p. 398,) that this insect is probably the Trama radicis of Kaltenbach (Monogr. der fam. der Pflanzenlausen, vol. i, p. 211); but that insect feeds on the roots of Leontodon Taraxacum, Cnicus arvensis, Sonchus oleraceus, Lactuca sativa, and Hieracium Pilosella.

POULTRY MANURE.

Poultry manure is one of the most powerful manures, and is therefore worthy of greater consideration than is generally bestowed upon its collection, especially as it soon decomposes, and consequently loses so much ammonia; and it would lose a still greater quantity of that gas did the excrements not dry quickly, and thus prevent a further decomposition of their urea. The strongest are those of pigeons and domestic fowls a fact easily explained, by the circumstance of their living chiefly upon grain, insects, and worms; wild geese eat grass also. That we may lose none of the ammonia developed during the putrefaction of poultry dung, we should do well to strew the yard and house in which they are kept with soil abundant in humus, for then the ammonia of the manure will be combined with the humid acid of the earth. The strewing of the ground with sand, saw-dust, &c., as commonly practised, is, in this point of view, of no use whatever. The excrements of pigeons have been chemically examined by Sir Humphrey Davy and myself. Davy found in 100 parts, by weight, 23 parts of substances soluble in water, consisting of urea, urate of ammonia, common salt, and some others. According to my own experiments, pigeon dung, half a year old, contained only 16 per cent. of bodies soluble in water, consisting of very little urea, but of a large proportion of carbonate, sulphate, and humate of ammonia, common salt, and sulphate of potash, the other 84 parts insoluble in water, consisting of coarse siliceous sand, silica, phosphates of lime and magnesia, traces of alumina, and oxides of manganese and iron. The abundance of soluble substances explains the quick effect of pigeon dung, and also shews us the great value of mineral manure. When the droppings of geese come in contact with the grass in pastures, they destroy it in a short time, so that farmers do not readily allow geese to have access to pastures; not to mention that, when the herbage is rendered foul by the excrement of these poultry, it becomes loathesome to other animals. The speedy injury inflicted on plants by goose dung, is occasioned partly by the uric acid it contains and partly by the ammonia which is so soon generated and developed on decomposition. When rain happens to fall, these caustic substances are diluted, and the grass grows the best in the places where the excrements lie, as may be seen in any goose-pasture. As poultry dung is very rich in powerful manuring matters, easily soluble in water, it should be applied only in very small quantities; and, in order to effect its due distribution, as it is generally dried strongly together, it must first be reduced into a fine state by thrashing or other means. In Belgium, they employ it particularly for manuring their flax, and calculate the annual value of the dung of 400 or 500 head of pigeons at 25 or 30 rix-dollars (about £5 or £6). Poultry dung must always be used as a top-dressing, or only harrowed in very lightly; and it should be spread over the ground when there is no wind. We should generally choose damp, but not wet weather, for the purpose, otherwise the main soluble substances would be carried too deep into the soil or washed away altogether. If a meadow be manured with poultry dung, and sheep driven on it soon afterwards, it is almost entirely eaten bare by them, probably on account of the many salts, including common salt, contained in this manure. Like all other manures containing much ammonia, it soon destroys moss in meadows. When it is wished not to employ poultry dung by itself, it will be found best to mix it into a compost heap with some soil rich in humus. A soil of this kind should be used with all organic remains containing much nitrogen, as all loss is thereby prevented.—*Dr. Sprengel.*

NOTES ON CATTLE AND MANURE.

Chemical preparations are acknowledged to be valuable assistants; but farm-yard dung is the main support of the land; as doubts have been thrown on the actual value of dung, properly so called, over rotted vegetable substances, I referred to Johnson's lectures, who states that in comparing the effect of the same vegetable substances before mastication and after, the weight of dry dung voided is considerably less than the quantity of dry food eaten; but vegetable matter is more sensibly active as manure after it has passed through the body of the animal, than if applied to the land in an unmasticated state. In becoming animalised, vegetable substances undergo certain changes. The lungs and skin give off carbon, leaving the solid excretions richer in nitrogen and saline matters, on which depend the value of manures, weight for weight than the crude vegetable. The state of combination in which the nitrogen exists in the excretions has also a material effect. The quality of the dung depends greatly on the food eaten. The use of oilcake and other substances is said to double the effect of the dung. The purpose for which the animal is fed has an influence. A milk cow, for instance, appropriates more of the food given than an animal which has not such a demand upon its system. The manner in which the dung-heap is treated materially alters the value as a manure; dung rapidly loses weight by being exposed; the moisture evaporates, the volatile matter escapes by fermentation, rain and wind deprive it of its most valuable qualities. By the time the straw is half rotted the loss amounts to one-fourth the bulk; if left long, little more than the weight of dry food remains. A quicker mode of fermentation under cover would be attended with less loss. The great value of urine and drainings of dung-heaps may be judged of; for they are found

to contain all the ingredients of the best dung. This suggests the propriety of saving it, and pumping it over heaps of vegetable matter. The quantity of fresh dung to be obtained from a given amount of food is said to be twice the weight of dry food, and the straw spread out; that is to say, for every 10 cwt. of dry fodder and bedding taken together, 20 to 23 cwt. of fresh dung may be calculated upon; but if Turnips or green food are given, as they contain so much water, less proportional dry manure is to be expected. The horse and cow, for 100 lbs. of dry food, give 210 of fresh, or 43 lbs. of dry dung; of roots, half their weight of fresh, 1-12th of dry dung, Six cows, getting 150 lbs. of food each, would give about 1300 lbs. of fresh dung. It was stated in your paper that 1 ton of Swedes, according to the litter, gave one ton of manure, and one ton of straw, near ten tons of manure.

I may mention a kind of farming in practice in the west of Scotland which is found to answer particularly well for both landlord and tenant. It is for a dairy farm. The proprietor provides cows, byres, and other buildings, and all dairy utensils, with food for the cows summer and winter. The tenants pay so much for each cow, and give the dung. They take entire charge of the cows and sell the butter and milk. There can thus be heaps of the best dung wherever there are suitable buildings. The system can be modified in various ways. The tenant may provide his own cows and utensils, and pay a rent for the fields in pasture and buildings; he will probably buy the winter food from the proprietor, who stipulates that he is to get the dung at a certain rate. This system ought to be extended, as it is of great benefit to a poor class of tenants, who never thrive on a regular farm, but on this system are found to thrive and pay punctually. The minute detail of cow feeding and dairy-work requires constant attention, which is much more likely to be given by a man's own family personally interested in its success than by paid servants, while the proprietor will work the ground better and manure more liberally than a tenant. He is also clear of markets. There is therefore reason for the system working well, as each has that department to manage which he will do best. The following are some calculations on cattle and dung.

To 20 stots at £7 10s.....	£150	0	0			
Interest for 5 months.....	3	0	0			
Expenses on cattle.....	1	0	0			
				£154	0	0
Ten acres of Turnips at £10.	100	0	0			
1500 stone of meadow hay at 4d.	25	0	0			
Attendance.....	12	0	0			
				137	0	0
Leaving a balance of.....				51	10	0
				£342	10	0
Sold 20 stots at £14 each.....				£280	0	0
Say 250 tons of dung at 5s. per ton.....				62	10	0
				£342	10	0

Let us next look to the return of the same 10 acres, if occupied by a different crop, and where dung can be bought instead of keeping cattle.

To 250 tons of dung at 5s. per ton,	£ 62	10	0	The above 10 acres in Potatoes at £18 per acre,	180	0	0
To driving 130 carts, being 2 loads a day, 2¼ miles at 5s. per cart, and tolls,	35	0	0	Meadow hay sold,	25	0	0
Leaving a balance of	107	10	0				
	£205	0	0		£205	0	0

The carriage of the dung is charged at 5s. on 130 carts, as they can go twice a day, and on the road can take a full ton; as they can take part of this load at least direct to the field, and would have to cart from the dungheap in the other case, the charge is too high. It may also be remarked that the money for cattle has to be expended in October and is returnable, subject to loss from death or accident, in March, whereas for dung it is not paid out till after the article is got, and a month's credit or more. In my own case dung can be bought at 4s. 6d. and Potatoes sold as high as £25 per acre. Where dung can be bought it implies consumers of produce, and with so large a balance in favour of cropping other crops might be grown with equal advantage. Probably the best plan for a proprietor will be to have sufficient stock of cows, bullocks, and sheep to supply the winter, at least, use of the house. These with the young beasts bringing on in sheds and loose boxes, together with the stable dung, and careful addition of all vegetable substances, will form a considerable dung-heap, which can be added to by purchase of dung, by giving Potato ground for their dung to the cotters, or on a more extended scale by the system of letting cows above mentioned. A proprietor whose property is in a populous district may sell the greater part of his crops on the ground, provided he conscientiously returns to the soil a full allowance of the best dung, but even their consciences are not sufficiently scrupulous on the subject to render it a safe way to treat the soil.—*Gardeners' Chronicle.*

From the Scottish Farmer.

A DAY AT MR. MECHI'S, TIPTREE HALL, ESSEX.

We went to Kelvedon by rail, on Monday morning last, whence we obtained conveyances to Tiptree Hall, which is distant about five miles. Although personally unknown to Mr. Mechi, our visit being by appointment, we found him at home. He received us most kindly. He appears in the prime of life; is above the middle height, of fair complexion, good looking, and has altogether the appearance of a kind and intelligent man. Although sanguine as to the success of his experiments, he converses with much candour on the subject. His conversation is infinitely more attractive than his writings.

Mr. Mechi first showed us over the entire arrangements of his farm-yard and buildings. For live stock his study has been to obtain a dry *bed*, warmth, and *air*. The bullocks are in pens in the bullock shed, and in each pen are placed *two bullocks, loose*. Proper troughs are placed at the head of each pen for food and water. The sheep sheds have the floors raised about three feet from the level of the ground; the floors are of battens three inches in width, having one inch openings between each batten for the manure to fall through. The value of this manure is highly spoken of by Mr. Mechi. About eighty sheep were kept in these sheds during the winter, and did well; at present the sheds are empty. About twelve square feet are allowed for each sheep in such sheds. Upwards of 100 pigs were classed in various pens about the yard. The pigs, as well as the bullocks, looked remarkably healthy and clean, and all were busily engaged eating mangold wurtzel. The cart horses were but of an ordinary description. A steam engine has lately been erected in a building adjoining the barn. The engine is used for various purposes, such as thrashing, cleaning, and grinding the corn into flour, cutting green crops, hay, straw, &c. The straw used for litter is principally previously cut into chaff. The buildings surrounding the yard have of course, eave gutters to convey away all water falling upon the building, and it is even in contemplation to put a light roof over the entire farm-yard, to keep the rain from the manure. Iron seems a favourite material: the pens being formed of iron hurdles as well as the fences. The troughs are of iron; as likewise the frames upon which the stacks stand. The boilers for steaming and preparing food for cattle are well arranged; in fact the whole of the buildings and arrangements in the farm yard are admirably adapted for the purposes intended.

Having finished our examination of the buildings, Mr. Mechi, with his bailiffs, accompanied us over the farm. The prominent feature of his system of farming is a white and green crop alternately, thin sowing, and the great desideratum of all farming, plenty of manure (farm-yard manure in preference to artificial) and drainage. The crops generally looked well, having a fine green healthy appearance, although the wheat appeared thinner on the ground than we had been accustomed to, but Mr. Mechi believes that he is more likely to have an abundant crop than if it were thicker. One land in a large field of wheat being sown with nearly the usual quantity of seed, he asked one of our party, who was a good judge of crops, to select from the field this land so sown.

The gentleman, after considerable care, pointed out the land in question, when Mr. Mechi laughingly retorted that he had been enabled to discern it by the assistance of the 'yellow tinge' in the lower blades.

Mr. Mechi informed us that seven quarters of wheat per acre were produced last season from a field on which he has now a good crop of peas growing, and was drained 12 feet apart and 2 feet 8 inches deep. Upon the rising land adjoining, is a field of wheat, which was drained 14 feet apart and 2 feet 6 inches deep, and although it is now some three or four years since this was done, the wheat over the drains to the width of about four feet looks stronger and better than on the intermediate spaces between that and the next drain. This is so decisive that a person standing half a mile distant could, by the fine appearance of the wheat over each drain, point out every drain in the field. In another field of wheat adjoining, the land has been drained 40 feet apart and 4 feet deep. The colour of the wheat over each of the deep drains was by no means so good or distinct as in that previously examined. One field, part of which is now growing a fine crop of beans, and upon the other part an excellent crop of clover, was drained 12 feet apart and 2 feet 8 inches deep. The land now sown with mangold wurtzel is drained 5 feet deep and 30 feet apart, but the plants not being more than an inch above the ground, we could make little observation with regard to the effects of deep drainage there. In another field there is a fine crop of winter barley in full ear, about 4 feet 6 inches high. The barley was sown in September. Another portion of the same field was sown with rye, which has been lately cut for stall feeding. On what is called the 'bog field' there is now growing a second crop of wheat in succession. Formerly some portion of this field was a complete quagmire, but by judiciously putting in a large drain, 10 feet in depth, the land was laid dry. From this drain flows a large stream of beautiful water, which supplies the house and premises. In a field adjoining, there is one of the heaviest crops of rye and tares we ever beheld. This field was drained about four years since, 2 feet deep and 14 feet apart, but early in the past year Mr. Mechi had, in addition to these drains, some put in 6 feet deep and 75 feet apart. In another field close by is an exceedingly fine crop of peas. This field was drained three or four years since, 14 feet apart and 2 feet deep, and notwithstanding Mr. Mechi's celebrated advocacy for very deep drains, he has had the great good sense not yet to alter the drainage on this field as well as some others, and the result is, that at present he has a sufficient quantity of land drained upon the different systems fairly to test their respective merits, *provided* he suffers them to remain undisturbed for two or three years longer. As for the first and perhaps the second year, deep drainage would doubtless have the advantage; but judging from the crop of land, and recollecting the long continued rains of last winter, we formed by no means that high opinion of deep draining at great width, of, say, 40 or 50 feet apart, as is entertained by Mr. Mechi. We also considered the clay on this land as altogether different in its nature from the strong London blue clay, or that which requires being frozen or white-hardened before it will dissolve in water; but although *differing from Mr. Mechi in opinion both as to the* mode of drainage, and as to the nature of his clay, we feel it but due to him to state, that he appears desirous of adopting not only the best method of draining, but of every thing else which he has to do at Tiptree Hall. He takes great personal interest in every improvement, and having realised an ample fortune by business, can afford both money and time carefully to test the merits of whatever plans may be considered desirable; and that there can be little doubt that the public are indebted to him for having so energetically called their attention to Agricultural improvements.

We would only further observe, by way of making our hasty sketch more complete, that in the pleasure garden is a greenhouse and hothouse, and an ornamental piece of water, whereon is a boat. The pleasure grounds are well laid out. Considerable additions have been lately made to the dwelling-house; on the left of the hall is a new drawing room most elegantly furnished.

AGRICULTURE AS A SCIENCE, AND INCREASING THE FERTILITY OF THE SOIL.

In whatever manner we may picture to ourselves the first practice of Agriculture, when the human race was still in its infancy, I think that it is pretty generally allowed that Agriculture originated in a desire, on the part of man, to have those plants which experience had taught him were useful to him, collected in his own immediate neighbourhood, instead of being obliged to gather them from a distance.

'It was a natural consequence of this desire that man should attempt to remove from their original site, and plant in his own vicinity those plants, the usefulness of which had attracted his attention, and excited his desire of possessing. And it is, moreover, probable, that such attempts were not always successful, nay, it is certain that many of them must, at first, have miscarried, and that men were taught gradually and by experience, which plants will bear transplanting and which will not. Thus the term cultivated plants becomes established and defined; in its more extended sense, this term means such plants as, from their usefulness to mankind, have become the subjects of care and labour to insure their growth, and which may be transferred from one locality to another, without their complete developement being prevented. Man could not, however, fail to observe very soon that the artificial cultivation of plants caused them to undergo considerable alterations in their nature and qualities; that the whole aspect of the cultivated plants differs from that of the wild plants; and that simultaneously with a change in the aspect, an alteration also ensues in those properties which render them useful, so that in one plant they increase, while in another they decrease by cultivation. It was, therefore, natural that the causes for these changes should be sought for, and that cultivation should be confined to those plants, the usefulness of which is augmented by their being cultivated.'

Of course man arrived at this knowledge by experience, and learned what plants admitted of cultivation, and, therefore, which to prefer for this purpose. The term cultivated plant, then, in its more restricted sense, is applied only to the latter kind of plants.

Cultivation has a constant tendency to oppose the peculiar development of plants ordained by nature, since it constantly endeavours to maintain their artificial or abnormal state.

For the purposes of cultivation, then, a knowledge of the constituents of the soil generally on the one hand, and of the especial constituents indispensable to the various kinds of cultivated plants on the other hand, are the necessary preliminary acquisitions to enable us to lay a rational foundation for Agriculture as a science. It is, therefore, very easy to explain why it is only of late years that Agriculture has been raised to the rank of a science, since chemistry itself, which must necessarily precede it, has but very recently become a science. It was only after the various substances surrounding plants—atmospheric air, water, and soil—had been chemically investigated, and after the material wants of vegetables had been ascertained by careful and minute examinations, that the construction of an Agricultural science could be reasonably thought of; all attempts at such an attainment, previous to the aid of a true chemistry, necessarily miscarried.

It may be asked how could it happen that Agriculture could be practised for thousands of years, and successfully too, without a scientific basis; or if an opinion has been formed that it may become a science without the aid of chemistry. I would answer and refute such objections by remarking, that Agriculture is *an art* as well as *a science*, and that the most skilful practice of an art, even from the earliest age to the present time, by no means implies that it must have a scientific basis.

Innumerable experiments have been made, and from an accumulation of experience, rules have been formed which it was necessary to follow, in order to practice the art of Agriculture successfully: these rules have been brought under

certain more general points of view; and in such principles and laws we trace the first attemps to establish a science of Agriculture. But the many errors derived from false experience, and the fallacious inferences drawn even from correct observations, have always made the theory thus constructed disagree with, and even contradictory to the practice of the art; so that neither has the theory been confirmed by the practice, nor has the practical art derived any real advantage from the theory. No better proof can be needed than this, than until very recently no real science of Agriculture has existed.

But it is now universally felt that the time has at length arrived when the mere empirical practice of the art of Agriculture is no longer sufficient. Agriculture, as an art, has probably reached its highest limits; the ingenuity of man has been exercised to the utmost in the mechanical labours of the soil, and in the treatment of cultivated plants; and it is altogether hopeless to expect any further improvements or inventions calculated to accomplish any great benefits in that direction. Nothing, in fact, remains to be done in this way. All the efforts, indeed, made at present to improve the practice of Agriculture are directed, consciously, or unconsciously, to the establishment of a science; and this can be accomplished only by a comprehensive study of the natural sciences and especially of chemistry.

The cultivators of the soil discovered the advantages of fallow, of the rotation of crops, and the necessity of manuring in an empirical way, that is by experience. But, notwithstanding these points have been known for thousands of years, yet the Agriculturist, up to the present moment, is obliged to act just the same as was done at the beginning, in spite of the existence of many universal defects in practice. People either have not dared to abandon the old methods, yet they have not been able to improve them, or their attempts to introduce improvements, being only based upon empirical experience, have failed, and the sacrifice of time, labour, and capital, have caused all deviations from the old beaten paths of practice to be looked upon with distrust. Agriculturists have come to regard it as a matter of course—as an established rule—that a farm, conducted upon theoretical principles, will yield less produce than it would in the hands of a purely practical Farmer.

In short, defects in practice are obvious enough upon many points; and yet theory has hitherto offered no assistance, because it has not been based upon correct principles. The art of Agriculture invented fallow, the rotation of crops, and manuring; but a true Agricultural science can alone bring them to perfection. This science may be subjected to two tests as to its truth or fallacy. First, it must not contradict well established experience; and secondly, where practically applied, it must yield more favourable results than mere empiricism.

It is pretty generally known that the chief part of the mass of ordinary soil contributes nothing towards the nutrition of plants, and that the necessity of the soil to cultivated plants consists of the mechanical support it affords them, and in its constituting a medium for transmitting the salts and the water essential to their growth and development. Plants take a large portion of salts from the soil for their assimilation; consequently if these salts are not replaced, the land becomes unfit for their full development, and the produce of the crop is much deteriorated. Three ways are open to the Farmer to restore to the land its former nutritive powers. 1st. *By the operation of summer fallow.* 2nd. *By the application of manures.* 3rd. *By the land being left a certain time under pasture,*

By summer fallowing, a writer on Agriculture observes,—'The desire for, and the necessity of rest, which nature has implanted in all animals when exhausted in long continued labour, has, no doubt, contributed much to the adoption of the practice of allowing the land to lie fallow. And although the parallel thus drawn between the functions of animal life and inorganic matter is neither correct nor logical, yet it has operated to establish the theory of fallow.'

The earth cannot sleep, nor are we warranted to assume that it could be agreeable or beneficial to it to be spared for a time the infliction of the plough; but the soil in most cases has the property of altering its state of aggregation, when left without ploughing, and of accumulating a large amount of the salts indispensable to the growth of plants, if left for a time without cultivation.

Summer fallows, as they are often made, are little better than half a fallow. The land should be continually stirred—not a weed allowed to grow, for if weeds are allowed to occupy the land, a crop of some description of cultivated plant might as well be grown.

We will next examine how the soil accumulates the salts requisite to cultivated plants during summer fallow. A soil may contain all the salts* necessary for the assimilation of plants, but being in a state of combination insoluble in water and inert. Many of these compounds are salts of silicic acid, and are designated 'silicates,' and these silicates are decomposed by the action of the carbonic acid of the atmosphere. Carbonic acid possesses an exceedingly powerful tendency to combine chemically with those bases which, in their free and uncombined state, are soluble in water, and when dissolved, manifest that peculiar taste denominated alkaline. By this change the silicic acid is liberated, and may be dissolved in water the moment it is liberated; and the bases, as potash, lime, and soda, having combined with the carbonic acid become carbonates, which are also highly soluble. It is thus shewn that a continual decomposition is going on; and if the minerals still present in the soil become decomposed so rapidly that the formation of alkaline salts and soluble silica keeps pace with the withdrawal of these substances in the crops, such a soil will always remain fertile. But this occurs very rarely, and scarcely ever in Europe. The continued stirring of the soil does not produce that benefit to the plants in a mechanical way that many persons suppose: it is from the greater surface that is exposed to the atmosphere which causes disintegration to take place more rapidly; consequently, the rougher the surface can be left, the quicker the operation.

Some there are that will state that there is no occasion to have summer fallow at all; others will as stoutly maintain the reverse. It is not my intention to defend the one or the other, as circumstances and situations must decide; however, I may mention that if many Farmers would give their land a summer fallow round, they would be great gainers by it, as they would then get their land thoroughly clean, which they are not likely to do by the hurried manner in which much land is prepared for the fallow crop.

2nd. *By the application of manures.* Continual harvests have, in the course of time, placed the soil in that state of exhaustion that neither summer fallow nor rotation of crops can restore it to the state of fertility requisite for the full development of cultivated plants without manure; consequently we must restore these constituents by that means. Plants take from the soil only inorganic matter, which we can restore to the soil in two ways; first, by burning the plants and using the ashes, and, secondly, in collecting the dispersed substances made by the use of plants, and restore them to the soil.

The first method cannot answer, as it would never do to cultivate plants for the purpose of consuming them by fire for manure; but because we expect to derive advantages from them, such as the nutrition of man and animals, and their employment in the arts, consequently, we are restricted to the second method, which is more circuitous.

It must be borne in mind that no plants can be employed with advantage as manure as long as they can be used for other purposes. We will briefly examine the various transformations they pass through during their use, in order to lose none of their inorganic constituents. Many plants are used for the nutrition of animals, which are finally consumed by man; others which are not fit for this purpose are used to litter animals, and for other economical purposes.

* Salts. The term salts is not limited to bodies possessing a saline taste. A great number of salts, including all those which are soluble in water, have not a saline taste. It is a term used for a combination of an acid and a base.

Start not at the assertion, but plants and animals, so far as their truly *organic elements* are concerned, are the *offspring of the air;* they are but condensed or consolidated air.

It is in the vegetable kingdom, therefore, that the great elaboratory of organic life is found; it is there that both vegetable and animal substances are compounded, and they are all alike formed at the cost of the atmosphere.

From vegetables these substances pass ready formed into the bodies of herbivorous animals, which destroy one portion of them, and store up another in their tissues.

From herbivorous animals they pass ready formed, into the bodies of carnivorous animals, which destroy or lay them up according to their wants.

Finally, during the life of these animals, or after their death, the organic substances in question return to the atmosphere from whence they originally came in proportion as they are destroyed.

Thus is the mysterious circle of organic life upon the surface of the globe completed and maintained. The air contains or engenders the oxidised substances required: carbonic acid, water, nitric acid and ammonia. Vegetables, true reducing apparatus, seize upon the radicals of these, carbon, hydrogen, azote, and ammonia, and with them they fashion all the varieties of organic or organisable matters which they supply to animals. Animals, again, true apparatuses of combustion, reproduce from them carbonic acid, water, oxide of ammonia, and azotic or nitric acid, which return to the air to reproduce the same phenomena to the end of time. And if to this picture, already so striking by its simplicity and grandeur, we add the indubitable part performed by the solar light which is alone possessed of power to bring into play this immense, this unparalleled apparatus, constituted by the vegetable kindgom, in which the oxidised products of the atmosphere are subjected to reduction, the picture is complete.

Thus we see that it is impossible to apply inorganic matter, let it be in whatever shape it may, wrong. It matters not whether it be the decayed straw of wheat alone, or the straw used as litter which has absorbed the fæces of animals, or the bodies of animals themselves—from the tiny sprat to the gigantic whale careering through the ocean, or the patient sheep and noble horse. The whole of their bodies are valuable for manure, bones, skin, flesh, and blood, when in a state of decomposition.

If the Farmer will think for himself, he will always find that science will assist him; for although practical experience possesses unquestionable value, it is like a vessel to which, in the form of science, the compass is wanting; it is a treasure which cannot be inherited. Science enables us to bequeath this treasure to our children, and it enables our children to increase the store. Science teaches us to recognise the food of plants, and the source from which it is derived. This knowledge alone makes us true masters of the soil and lords of our capital.

3rd. *By the land being left a certain time under pasture.* It is well known that if land is properly laid down in grass, and well stocked with sheep, it reacquires a considerable portion of the fertility which it has lost by continued cropping. Much also depends on the kind of stock employed to eat the grass. Stock which has come to maturity is the best; milk cows and young growing stock the worst, the latter from not having the whole of their frame fully developed, require a larger portion of salts for the formation of bone and muscle, and milk cows for the formation of milk; consequently, having assimilated so much for themselves, less is passed off in urine and dung.

If any person has the curiosity to examine an old grass pasture that has never received any manure, except left by stock, they will find two or three inches of the surface quite free from stones, the soil being of a rich soapy consistency; the whole of this soil is formed from the decayed roots and leaves of the grass, and the dung of the stock employed, so that a supply of manure for the following crops has been gradually accumulating during the time it has been pasture.

No general rule can be laid down as the period in which the soil will be able to regain its former fertility; this depends principally on the number and quality of the stock.

In some counties, the slovenly and injurious practice exists of taking two, three, or four corn crops in succession, and then laying it down in grass to rest.

This is now confined principally to the south-eastern counties. The manner in which land is often laid down appears to be left in a great measure to chance, as the soil is often in a very foul state, and the seeds sown are not those best adapted to the soil, but such as the Farmer fancies are the best. By this system the grasses indigenous to the soil soon become master, and long before the land is broken up for the next crop, the principal part of the grasses sown have disappeared, and nothing but a bed of weeds left.

Again, the whole of the produce of grass must be consumed on the land—none carried off for the purpose of soiling or for hay. The pastures should be well stocked, and as few seed stalks allowed to rise as possible.

In some instances the subsoil is considerably richer in salts (that percolate rapidly) than the surface. When this is the case a crop of buck wheat is very useful; it being a deep-rooted plant, it brings many of the salts again to the surface which are contained in the stem and leaves. This crop should be ploughed in when in flower, which is found a good preparation for wheat.

After all, the soil, as Mr. Milburn observes, 'is never so utterly impoverished by cropping as not to be still capable of producing something.' The productive faculty composes what may be termed its natural fecundity, which, although existing in various proportions according to its original fertility, yet when capable of producing five bushels of rye per acre, besides the seed may be supposed equal to forty degrees; its full value being estimated at a hundred. Now, from various experiments which have been made on a large scale, it is supposed that the application of about eight tons per acre of well-fermented farm-yard manure, of average quality, is equal in its effects to fifty degrees of nutritive matter, and that a bare summer fallow, not only by the influence of its working on the land, but also by producing the decomposition of the weeds which it destroys, is equivalent to 10 degrees, thus bringing the soil round to its former state, and rendering it again fit for the production of further crops.—*Thomas Kier Short, Martin Hall, Notts, in Farmers' Herald.*

To the Editor of the Mark Lane Express.

Sir,—In your paper of last Monday you allude to the current report "that the late Anti-Corn-Law League were about to recommence their labours under the former leaders, for the purpose of effecting further reform;" or, in other words, subverting the constitution of the country, as their previous agitation has the credit and well-being of the people generally.—I looked for some other mad scheme from that source after reading a copy of Mr. Cobden's letter, wherein he states "the Testimonial Fund" had placed him in a position to devote himself entirely to public business," alias mischief, for what else has his free trade theory proved in practice? Are not the very people by whom the league was got up, for their own exclusive benefit at the expense and ruin of agricultural interests, in a worse state now, than before the alteration of the law? Look at the reports from Manchester and others of the manufacturing districts; and let me ask the question, supposing the subscription for the Cobden Fund was now to be commenced, would Manchester give upwards of £25,000, and other towns in proportion? or, query, would they give as many shillings? with the result of free trade now proved in reality, viz, nearly a total stop to their foreign, and a great falling off in their home trade; the natural consequences of their own acts. For what said the *Times* a few weeks back? why, that foreigners were building mills and factories with money procured here in exchange for their corn, and now manufacturing for themselves: of course they are; and the manufacturing league, assisted by a weak ministry, furnished them with the means of doing so; and also of competing with them as they will do on all the continental markets. Who, then, it may

be asked, has benefited by the cry of "*Cheap bread*" (*and no money to buy with.*)? The manufacturers, for whose benefit the change was made, don't appear to be prosperous from the reports in their districts; the farmers certainly cannot be, with decreased prices and increased rates; the shipowners are not, it appears: the revenue has not gained—see the renewal of the income tax required—and it is very evident the labouring poor are worse off than before. Who, then, I ask again, has benefited by this great and wise alteration in our trading laws, which has made Mr. Cobden the master of thousands, and the attempted arbiter of this country's future destiny?—Why, the *foreigners* are the only parties who have reason to bless the name of Cobden, for they, like himself, have pocketed the coin. The manufacturers, as a body, are not to be pitied, for it was their party, through the league, that brought about the change, at the expense, as they thought, of the agricultural interest only; forgetting that the well-being of the one, was necessary to the other. But the working-classes, that are now feeling the want of work, and consequently the means of living, and deluded as they have been by a set of adventurers, to them the change has indeed been heartrending.

When will the people have their eyes opened to the bane arising from class legislation, and see the necessity of providing for themselves, and the benefit of their own country, instead of making laws for foreigners to their own injury, and succumbing to apathy of interested adventurers like the league? Yours, obediently,

9th June 1848. A KENTISH FARMER.

MILKING.

This is a subject of too much importance to be passed over; and I fear that I must add that it is a subject far too much neglected. The milking of cows resolves itself naturally into two heads—viz., how to milk, and when to milk. I. *How to milk.*—It is astonishing what difference there is in good and bad milking. 1. If every drop of milk in the cow's udder be not carefully removed at each milking, the secretion will gradually diminish in proportion to the quantity each day left behind. This fact is well established, and is to be well accounted for on philosophic principles, as well as borne out in practice. Nature creates nothing in vain, and the secretion of milk in the cow only suffices to supply that daily lost—the milk left behind in the udder is re-absorbed into the system, and consequently the next milking will be so much the less in quantity. But another reason why every drop of milk should be taken away, is to be found in the well known fact, that the last milk is double as good as the first milk; hence, if not removed, there is not merely equal, but double loss. 2. Milking should be conducted with skill and tenderness—all chucking or plucking at the teats should be avoided. A gentle and expert milker will not only clear the udder with greater ease than a rough and inexperienced person, but will do so with far more comfort to the cow, who will stand well pleased and quiet, placidly chewing the cud, and testifying by her manner and attitude that she experiences pleasure rather than annoyance from the operation. Cows will not yield their milk to a person they dislike or dread. I have taken some trouble to acquire the art of milking, in order that I might be able to describe. You take the teat in your palm, enclosing it gradually in your fingers, tighter below than above, but not absolutely tight anywhere—a portion of the upper part of the hand, the thumb is uppermost—embraces a portion of the udder, and the whole hand is drawn gently downwards, towards the extremity of the teat between the thumb and the forefinger; very little practice enables the milker to do this with ease, rapidity, and tenderness. I need not say let the hands be carefully washed before each milking; but I dare say it is seldom thought necessary to wash the cow's teats.—This, nevertheless, should be done, and it will then be found that the milk will flow more freely with any teats, than if you wet them with the milk; at least, I find it so, and think myself an expert milkman. 3. We now require to consider when the cows are to be milked—a question again resolving itself into two minor ones—viz., at what hours, and how often? The ordinary practice is to milk cows twice daily—at about five o'clock in the morning, or in the winter, as soon after daylight as possible, and again in the same hour in the afternoon, thus leaving twelve hours interval between each milking. Some recommend milking three times daily during the summer months, stating as their reason, that cows are then after calving, and flush of milk, and that the three milkings are calculated to increase the quantity of the secretion.—Some even recommend four milkings during that season.—There can be no question but that, when fed in proportion, such a constant demand would necessarily increase the quantity of milk secreted: but then it is likely that the same causes might produce such a depression in the secretory system—naturally consequent upon unusual excitement—as would cause a decrease of milk in autumn and winter, in about equal ratio.—*Farmer's Journal.*

THE CLAY FARMER OF THE OLD SCHOOL.

His holding is about 150 acres of stubborn clay land, well saturated with moisture. The pasture aboundethi n Rushes and sour Grass, and in damp weather 'poaches' considerably. The arable is cut up into long slices, of a pale unwholesome colour, and in summer rejoiceth in Thistles, which he says is a sign of its strength, as all the world knows that land which groweth good Thistles groweth good corn. The Rushes aforesaid he hath also a considerable liking to, as affording "a bite for the stock when they can get nothing else." His dwelling is situate apart from the highway aad usually in a hollow; it is timber framed, filled in with brick or earth-work as the case may be, and shows every outside evidence of damp and inside ditto of smoke; his garden is a bit of a wilderness, unwholesomely crowded with Apple trees, which have covered themselves with a substantial great coat of Moss and grown together in the most admired confusion. The buildings are of an ancient date, and the pride of their holder; they consist of a barn, with a wonderful extent of thatched roof, of a hovel nearly roofless, of a stable where daylight never enters, and of a piggery pre-eminent for the damp and cold lodging it affords its inmates. These time-honoured buildings inclose a yard sloping gradually to a pond verdant in summer with duckweed, and in the winter the recipient of the little richness that can be washed out of poor dung. The man himself may be about 40, of less than the average size, with a pursed up mouth and contracted cheeks, but with a look of peculiar confidence in his own astuteness; he indulgeth in a round frock, as becoming his station; corduroy smalls, laced up boots, and leather leggings; from a somewhat pertinacious habit of keeping his hands in his breeches-pockets, he has avoided any great outlay in gloves, and contracted a considerable stoop in his shoulders. His father was a farmer before him, and "he has been brought up to farming all his life, and ought to know something about it;" and his opinion is that he does, and that he has arrived at perfection in the pursuit, and he has a great contempt and pity for any one who follows the occupation without having had the benefit of an apprenticeship like himself. He followeth the same rotation his father did before him—Fallow, Wheat, and Oats; and looketh upon any one as a dreadful heretic who follows any other. He knows "that it is the best and most paying," albeit he never keeps accounts. He considereth his neighbour who draineth as one demented, and "knows he'll be nicely catched the first dry summer." Turnips on clay, he says, will never do; and if his neighbour getteth a crop of them, he says "it will never pay to go to such expense, and that he will find it out before long." His stock is of what he call a "hardy kind," somewhat stunted in growth and long in the coat; in summer they run in the rushy meadows before alluded to, and in the winter are taken into the yard to luxuriate upon Oat-straw and the rich fluid from the pond, unsheltered, but endeavouring to keep up their animal warmth by chasing and poking each other about. In regard to implements he looketh upon a wooden turnwrest plough as the perfection of human ingenuity; he hath seen an iron plough in the course of his travels, which

he describeth to his men, "as a grimcrack affair, and never no use to nobody." The even tenor of his way is sorely disturbed at the prospect of rent day, for which he is rarely prepared; albeit he selleth all he can off his farm; his appeal to his landlord's agent is somewhat of an earnest character; he assureth him that he hath laid out large sums upon the farm, and that it is now just beginning to pay; a reprieve is granted, but he seldom looketh up arrears. His amusements are few, and inexpensive; he goeth to church on a Sunday, in a blue coat with brass buttons, and spendeth the afternoon in watching the progress of his pig, leaning on the sty and smoking his pipe. He goeth to market at the next village once in the week and holdeth forth on the superiority of his farming, and endeavoureth to prove by sound argument that if "they free traders" had not interfered and checked his triumphant course by the withdrawal of "protection," that he should have grown 12 sacks to the acre this last year, notwithstanding early threshing hath plainly told him his produce was not over five. He getteth home from the market in a somewhat confused state, and is proportionably irritable on the following morning. Once in a year he attendeth an agricultural meeting, and is roused to an unusual degree by the speeches then and there delivered; his enthusiasm, however, only shows itself in somewhat hurried whiffs of his pipe, and in the few words that fall from him being delivered more slowly and sententiously than usual. Such is, we believe, a correct portrait of the "Clay Farmer of the Old School." And such he will be to the end of all time, a stubborn piece of mortality truly.—*Agricultural Gazette.*

Filling up Drains (Essex).—The oldest, and with many at the present day the best method, is what is called ramming. It is done in this manner: The bridge or core is placed at the bottom of the drain, and some of the clay is pulled in upon it; then it is rammed down similarly to the paving-stone in London, and the bridge being pulled forwards as the work proceeds, leaves a tunnel behind it. This seems to be a very contradictory process; after digging out the stiff clay to make it still more impervious to the water, but if the theory that the water enters the drain not at the top, but at the bottom and sides, it can make no difference; and it stands well I know, having frequently seen drains cut across that have been done from 20 to 30 years, and the top appeared to be as perfect as the day it was done. The next in rotation is making straw ropes of the size to fit tight into the neck of the lower spit, and pushing them in with the feet. This plan seems to have seen its day, and is now rarely done. The most prevailing plan seems to be putting in the place of the lowest spit bushes cut from the hedges, and just placed so as to keep out the soil till it is consolidated again. But the best of all that I have seen (except putting in tiles) is pieces of turf or peat cut into lengths, and of the width of the lower spit. These when carefully put in and well trodden down, there is no doubt will last for 50 years or longer, and there is no objections to them like ramming, as the water will pass through them just like a sponge after it is saturated with moisture; but the expense in this part is too much for them to be generally used; not the actual cost of the material, but the carriage, as they have to be brought from the fens in Cambridgeshire. There is one other point to which I would draw the attention of those who may be only just beginning to drain, that is to carry every drain directly into the open ditch or main drain, as I have frequently seen many acres of drains rendered worse than useless by the leader becoming filled up.—*E. X., near Braintree.*

INFLUENCE OF THE PRESS ON AGRICULTURAL IMPROVEMENT.

Mr. Payson, in his address before the Essex County (Massachusetts) Agricultural Society, says—'To enumerate *all* the improvements, which have been made in Agriculture for the last half century, would take too much time. *One*, not only an improvement in itself, but the *basis* of all other improvement, must not be omitted, and that is the diffusion of Agricultural knowledge by the newspaper press. Slowly, silently, almost by stealth, without the knowledge of the man himself, this mighty engine undermines old prejudices, and teaches the Farmer that however independent he may be, he is not so wise that the experience of others will not profit him. Most of us have become willing to seek *directions* even though they be contained in a book. We are becoming more like liberal, free-born, and aspiring men.'

In relation to the same subject, Mr. I. S. Hitchcock, in his address before the Oneida County (N. Y.) Society, observes—'A medium of communication between Farmers was found to be indispensable to the advancement of their interests, and the periodical Agricultural press was established. That Agricultural journals are among the most decided, and least expensive means of promoting Agriculture, no one who has been favoured with their perusal for any length of time, will pretend to deny. While their influence has been highly beneficial, they have injured no one; and since their utility has been fairly tested by experience, that Farmer is guilty of unpardonable inattention to his true interests, who neglects to provide himself with a well-conducted Journal of this kind.—I am aware there is a prejudice against what some are pleased to call book-farming. And what is this book-farming in relation to which such unfounded and untenable prejudices prevail? Farmers communicate to each other the results of their experience in raising horses, cattle, sheep, and swine, the best and most economical modes of manuring their lands, the most profitable crops, and the best manner of raising them, the best breed of animals, and the best mode by which they may be fatted—in short, everything relating to the occupation of the Farmer. The result are committed to paper, go through the press, and become a book, and those who choose to be aided by the experience of others, as there detailed, are guilty of book-farming.—*Farmer's Gazette.*

Newcastle Farmer.

COBOURG, CANADA WEST, SEPTEMBER 1, 1848.

The preparations for the approaching Exhibition of the Provincial Association, are in progress, and bid fair to be far the most applicable to the purpose of any hitherto used for those occasions. There will be sufficient room for the classification of the articles and the comfort of the visitors, and the erections will be such as to secure all articles sent for exhibition from any injury to the weather.

An irregular octagon, containing about six acres is appropriated to the purpose; five of the sides are intended to be fitted up with Pens, Stalls, and Tyings for the Cattle, Sheep, Pigs, &c. &c., the remaining three sides will be occupied with

Booths for refreshment, Committee Room, and entrance Gates. A carriage drive will enclose an area sufficient for the principal buildings and also for the display of all *the larger* implements and machinery, and outside the drive will be a promenade for visitors on foot. Three buildings sufficiently capacious to exhibit all the Floral, Horticultural, and Agricultural products to the best advantage, will shortly be completed; such articles occupying the centre, while articles of domestic manufacture of every description, together with specimens of the Fine Arts, with those numerous articles comprised under Class P, (the Ladies' Department,) will be found in the adjacent buildings.

The Committee hope that every effort will be made, especially in the neighbourhood, to uphold the character and further the intent of the Association, by contributing for exhibition, all such articles as shall be interesting and gratifying in every department.

It would appear from the latest statements that the Wheat crop, taken altogether, will not be so bulky as was generally anticipated. This will arise from the great deficiency in the Spring sown Wheat, most of which has failed, to a great extent, from the rust, and in many instances whole fields are completely worthless, will not repay *in grain*, the labor of threshing; thus has the toil, skill and care of the Farmer been completely thrown away, and all his labor and expense rendered nugatory by circumstances beyond his control, and by an evil he could not avert. We hear sometimes of certain descriptions of wheat which *will* not rust, but of this we are more than doubtful, but if there are such, it would be a great benefit conferred on the farming community by the introduction of the seed for general use. We have tried nearly all the descriptions in use, and have not found any that have been exempt, if at a particular stage of their growth, the state of the atmosphere was such as to induce it. It is well known that it is at a period when the plant puts on its most promising appearance, and while in its rank luxuriance; when its flow of sap is abundant as if Nature was making its last strong effort to fill the swelling grain and realise its hundred fold increase, that an atmospheric change, usually from bright and sultry to damp, foggy and chill, is the almost certain precursor of the blight or rust, and this cannot be guarded against by the most vigilant care and attention; no preventive can be used, no remedy applied; but, although no cure may be found, more may generally be saved from the wreck than is too frequently the case. It may usually be discovered by the observant Farmer, within a few hours after it occurs, when satisfied on this point, the crop should be cut immediately; it is impossible it can be better, (grain or straw) it is *certain* to be worse.

Spring Wheat, in consequence of the many failures to which the autumn-sown varieties are liable, has, within the last ten years, been in general use, and much dependence placed upon it for a main crop, and from observations made by many persons, it would appear, from the small amount of land under process of fallow at this time, that the larger portion of wheat will be sown in the spring, and should the rust again occur to the same extent as on the present occasion, there will be a serious deficiency in the amount of "grist for the mill." It will be advisable if such a practice is determined on, to give the land its seed furrow before winter, and by all means to sow as early in the spring as possible,—Wheat rarely suffers to any extent by the late frosts,—and by being got in early it covers the ground before the parching heats check its progress, and although this method may not *prevent* its being rusted, it is a chance in its favor, which should not be lost sight of, to enable it to be sufficiently in an advanced stage of growth before the usual period of extreme sultry weather.

The appearance of the Potato haulm would seem to indicate a very general failure of crop in many places, but judging merely from our own, (which look deplorably) we should incline to the opinion that it is only in appearance, for having dug four distinct varieties without meeting with more than one unsound, we indulge the hope that the failures from disease will be but partial and limited in extent. Those who wish really good Potatoes for the table during the winter, may rest assured that they cannot obtain or preserve them in the usual way adopted of digging and storing them: the men turn out in the morning to dig them, leaving them on the surface until the after part of the day, when the women and children are turned out to pick them from the ground, where they have been exposed to wind and sun for five or six hours, they are then heaped up in a corner of a cellar, or packed away in close contact, tight as herrings in a barrel, and all that is deemed necessary is carefully to exclude the frost. Potatoes may be, and are thus kept and used as good, sound, wholesome food, but all who use them are perfectly aware that, however good the variety, however free from taint, and however well preserved in this method, they are never nearly so good as when first lifted from the soil. And why not always have them fresh from the soil? why not pack them in the soil? clean, good sand is cheap enough, let it be collected to the amount of one barrel of sand to two of Potatoes, let it be well dried in the sun, if there is any, if not, in the wind, and shaken into the barrel, or mixed in the bin with the Potatoes, filling up all the interstices as compact as possible,—this is an additional security against frost, and murphy will turn out at any time nearly as good as new.

The Flower Garden.

From the Horticultural Magazine.

FLOWERS AND ORNAMENTAL PLANTS OF THE INDIAN ISLANDS.

Nature has scattered her richest gifts broadcast over the surface of the Eastern Archipelago. There is no form of magnificence and beauty under which she does not there present herself, from the quiet loveliness of the secluded valley to the grandeur and sublimity of an Alpine landscape. Mountains and forests, jungles, prairies, and cultivated lands, hills, valleys, and streams, are met in succession as the traveller pushes his advance across the interior provinces of those little-known countries, which have been termed the group of Twelve Thousand Islands, from their multiplicity, and the vast space of sea which they stud.

To others we leave the animals, the agriculture, the minerals, and the geography of the Indian Island; our province is to describe, as fully as is consistent with the present state of knowledge on the subject, their floral beauties, various and magnificent as they are. "You breathe," says an old author, "in the Eastern Archipelago, an air impregnated with the odour of innumerable flowers of the greatest fragrance, of which there is a prepetual succession the year round, the sweet flavour of which captivates the soul, and inspires the most delightful sensations;" language highly wrought and poetical, but yet not without its truth. The Indian islanders are passionately fond of flowers; their women are never considered dressed unless decorated with a profusion of them, and when any beautiful thing is to be expressed, the name of some flower is made use of.

The prevailing colours of all the floral race of the Eastern Archipelago are yellow and red, though other hues are also frequently met with. It may also be observed that some of the most magnificent of the Indian flowers are the produce of large trees, though a considerable number grow on shrubs and humbler plants, especially creepers; their perfume is generally oppressive and heavy when close, but at a distance the sweetest odours are given forth.

Borneo produces many gaudy and many elegant flowers; one specimen of the rhododendron may well be termed gorgeous; it grows with its roots winding round the trunk of the forest trees, and bears large heads of flowers, sometimes eighteen in a cluster, of various shades, from a pale but rich yellow, to a reddish salmon colour, which in the sun sparkles with the brilliancy of gold. There are four other species of this plant, crimson, red, and a mixture of the two.

The clerodendron is a shrub ten feet in height, having at the point of every branch a loose sheath or spike of rich crimson flowers, projecting, two or three feet from the foliage.—The stems are red, while in the centre of every flower is a pure spot of white, the whole forming a magnificent pyramid. When the clerodendron has done flowering, there remain on every stem four seeded berries, of a dark blue colour, which, combined with the crimson stalks, cause the plant to remain scarcely less gaudy than before. There are also different species bearing white and scarlet flowers.

The Bringa kasihan (cœlogyne,) or flowers of mercy, are highly fragrant, and of a delicate white or orange hue. A gigantic specimen of this plant has been introduced by Mr. Hugh Low into this country.

There are many beautifully blossoming flowers which grow abundantly on the banks of the Bornean river among which is one (bignonia) very fragrant, having a white fringe around it.

Of climbing and creeping plants Borneo produces a great abundance, among which is a species of bauhinir, totally new and undescribed. When in full blossom it bears luxuriant clusters of gaudy, crimson flowers. Another (Hoya imperialis) has been found loaded with bunches of purple and ivory coloured blossoms; while another, which has been named after the Earl of Auckland, is hung with rich bunches of the most magnificent size and richness of hue. In the woods of Borneo many beautiful parasitical plants were seen by Captain Mundy, some of them adorned with lovely blossoms, completely wrapped themselves in close, thick, matted folds round the supporting trunk, which they continued to encircle until it perished in the treacherous embrace, and mouldered to a heap of fat vegetable matter.

Eight different species of the pitcher-plant have been discovered among the Indian Islands; that named after Sir Stamford Raffles grows on the rocky islands in the neighbourhood of Singapore, and never exceeds five feet in height, while the Nepenthes Hookeriana, found in Borneo at the bottom of deep jungle vallys, climbs to the summit of tall trees. Some of the pitchers hold a pint of water; the leaf hangs downwards, and is furnished with a strong rib, from which the curious formation which has been called the pitcher depends; a column runs up the back of this and supports the lid. Two species have been observed; one, dark green above and reddish peach coloured beneath, while the other is a green spotted with crimson.

Another species has been discovered (Nepenthes ampullacea,) which is also a climbing plant; the stems, however, by degrees, drop from the supporting trunk, and moulder on the ground, when they are covered in a short time with vegetable matter, which forms a coating of earth about them; from this spring many shoots, which in time become new plants; and the spot of ground is thus gradually covered with a carpet, as it were, of these curious formations, over which are scattered a number of the pitchers, which, as the leaves gradually develope, wither and disappear, when the plants begin to flourish luxuriantly and climb into the trees. Mr. Brooke, in his new work, describes a beautifully flowering plant, covered with abundant clusters of yellow and red berries, which he wished to transport to this country, but probably failed.

Herbaceous plants abound on the exposed and damp roads of Borneo, while in mossy places two species of anætochilius have been found, the one with golden coloured leaves, and the other still more beautiful.

The English Rajah of Sarawak has a garden in front of his house, where a profusion of the jasmine and Camellia japonica diffuse the most delightful perfume around; indeed, has taste seems to be in all cases guided by a strong attachment to flowers and sweet smelling shrubs, which he seizes on every occasion to enjoy and describe. Captain Mundy also seems to luxuriate in the odoriferous plants of the river banks of Borneo.

Fever in the Horse.—These symptoms are thus described by the late Mr. Youatt:—"Fever is general increased arterial action, either without any local affection, or in consequence of the sympathy of the system with inflammation in some particular part. The first is pure fever. Some have denied that it exists in the horse, but they must have been strangely careless observers of the diseases of that animal. The truth of the matter is, that the usual stable management and general treatment of the horse are so absurd, that various parts of him are rendered liable to take on inflammation, that pure fever will exist but a very little time without degenerating into inflammation of these parts. The lungs are so weakened by the heated and foul air of the ill-ventilated stable, and by sudden changes from almost insufferable heat to intense cold; and the feet are so injured by hard usage and injudicious shoeing, that, sharing from the beginning in the general vascular excitement which characterises fever, they soon become excited far beyond other portions of the frame; and that which commenced as fever becomes inflammation of the lungs or feet. Pure fever, however, is sometimes seen, and runs its course as fever. It begins frequently with a cold and shivering fit, altho' this is not essential to fever. The horse is dull, unwilling to move, with a staring coat, and cold legs and feet. This is succeeded by warmth of the body; unequal distribution of warmth to the legs; one hot, and the other three cold, or some naturally warm, and others unusually cold, although not the deathy coldness of inflammation of the lungs; the pulse quick, soft, and often indistinct; breathing somewhat laborious; but no cough, or pawing, or looking at the flanks. The animal will scarcely eat, and is very costive. While the state of pure fever lasts, the shivering fit returns at nearly the same hour every day, and is succeeded by the warm one, and that often by a slight sweating one; and this goes on for several days until local inflammation appears, or the fever gradually subsides. No horse ever died of pure fever; if he is not destroyed by inflammation of the lungs, or feet, or bowels, succeeding to the fever, he gradually recovers."

The Sensation of Heat depends as much on the state of our own bodies, as that of the external bodies, which excite the sensation; the same body at the same temperature producing different sensations of heat and cold according to the previous state of our bodies when exposed to it. But even when the state of our bodies is the same, and the temperature of external objects the same, different objects will feel to have different degrees of heat. In the ordinary state of an apartment, at any season of the year, the objects which are in it all have the same temperature, and yet to the touch they feel warm or cold in different degrees; the metallic objects will be coldest; stone and marble less so; wood still less so; and carpeting and woollen objects will feel warm. When we bathe in the sea, or in a cold bath, we are accustomed to consider the water as colder than the air, and the air colder than the clothes which surround us. Now, all these objects are, in fact, at the same temperature. A thermometer surrounded by the cloth of our coat, or suspended in the atmosphere, or suspended in the sea, will stand at the same temperature. A linen shirt, when first put on, will feel colder than a cotton one, and a flannel shirt will actually feel warm; yet all these have the same temperature. The sheets of the bed feel cold, and blankets warm. A still, calm atmosphere, in summer,

feels warm; but if a wind arises, the same atmosphere feels cold. Now a thermometer suspended under shelter, and in a calm place, will indicate exactly the same temperature as a thermometer on which the wind blows. These circumstances may be satisfactorily explained, when it is considered that the human body maintains itself almost invariably, in all situations, and at all parts of the globe, at the temperature of 96 deg.; that a sensation of cold is produced when heat is withdrawn from any part of the body faster than it is generated in the animal system; and, on the other hand, warmth is felt when either the natural escape of the heat generated is intercepted, or when some object is placed in contact with the body, which has a higher temperature than that of the body, and, consequently, imparts heat to it. The transition of heat from the body to any object, when that object has a lower temperature, or from the object to the body, when it has a higher temperature, depends, in a certain degree, on the conducting power of the objects severally; and the transition will be slow or rapid according to that conducting power.

Swallows.—These mysterious visitants, creatures of instinct, are by many persons supposed to perform their eccentric gyrations from mere caprice, while in reality, they are amongst the very best friends of mankind. I would as soon see a man shoot one of my fowls or my ducks, or rather he would steal his hatful of eggs from the hen-roost, as shoot one of these beautiful annual visitants, or destroy one of their nests. My servants think I have a superstitious love, or dread, or fear of them, from the religious regard I pay to their preservation. If it were not for such beautiful and graceful birds, our crops would be totally annihilated. We have no idea of the number of such. Take the plant-louse—the British locust. Bonnet, whose researches on it remind us of Huber on the Honey-bee, isolated an individual of this species, and found that from the 1st to the 22nd of June, it produced 95 young insects, and that there were, in the summer, no less than 9 generations. There are both wingless and winged, and Bonnet calculates a single specimen may produce 550,970,489,000,000,000 in a single year, and Dr. Richardson very far beyond this. When we see the swallow flying high in the air, he is heard every now and then snapping his bill, and swallowing these and similar destroyers. Now, if at this season a swallow destroy some 900 mothers per day on an average, and estimating each of these the parent of one-tenth of the above number, it is beyond all appreciable power of arithmetic to calculate. If instead of paying boys for destroying birds and their nests, they would pay their cottagers, children a prize for every nest fledged of swallows, martens, and swifts, they would confer tenfold more benefit on their crops.

Vipers.—I have no doubt whatever as to the fact of young vipers entering the stomachs of their mothers in case of alarm; for I have seen it happen under my own eyes. About 10 years ago I was building a wall near my house; and an old quarry being near, my men were taking from it some loose stones, under which they had found and killed several vipers; at length they moved a large stone under which lodged about a dozen little vipers, about 5 inches long and about the thickness of a tobacco pipe; they were very active and ran away in all directions, we killed several of them, and saw four or five go under another large stone near, upon moving which we found, not the little vipers but a large one; from the size of the latter, I suspected that it must have received the young ones into its stomach; we killed it and immediately after saw the head of one of the young ones coming out of its mouth! I obtained a glass bottle, which I placed against the old one's mouth; one of the men trod upon the tail, and with a stick I gently pressed the stomach, out of which four or five young vipers ran with great activity into the bottle, which I stopped closely with a cork, and gave to Mr. Adye, surgeon, of Bradford, our then country coroner, who kept the vipers alive in it for some time.—*William Stone, Winsley, near Branford, July* 1.

Transmutation of corn.—I was attracted in passing a cottage garden on the 30th May by some fine ears of Barley, and so unusually early a period for its development made me suspect it had been planted as Wheat. On enquiry I found this to have been the case; the occupier of the garden (James Thompson, of Pastom, a village on the sea coast,) informed me that his son and himself dibbled a very choice sample of red Wheat a few days before old Michaelmas; that from its growing rank, he mowed it the beginning of January, and the result has been a fine crop of Barley, the ears well set with grain; on one side, where the plants were not touched, the natural produce of Wheat has been produced. The North Walsham Club, in whose district the village of Paston is, will most likely, through some of its members, draw attention to it. What will be the result of the crop next year from this seed Barely?

Unnatural and Injurious Over-feeding of Breeding Animals.—At very many of the meetings and gatherings of the president, vice-president, and members of council, as well as at the yearly general and country meeting of the Royal Agricultural Society, and, in short, at most agricultural societies, you will find this subject discussed, and correct views on it most strongly and urgently recommended, and instructions given to the judges not to take into consideration the fatness of animals in awarding prizes to stock intended for the purpose of breeding. In the face of these instructions, what is the general result? Why, that year after year, and meeting after meeting, the premiums are still given to a most unnatural and (to breeding stock) very injurious fatness. Fat is sure and certain to carry away the palm whenever placed in competition against rational and fitly fed animals of every class and description, and that are in a natural and much safer condition for breeding, both as regards themselves as well as their produce, but that are not made almost immoveable—most unweildy, by their joints and sinews being, as it were, rendered of no effect by useless and injurious fat. Bear in mind that I confine my observations wholly and solely to breeding stock, and if the judges would, in awarding the premiums, take into consideration the aptness and fitness of condition for breeding, combined with shape and make and quality, and give these their proper and right and all important place (even to the discarding of over-fed breeding animals,) they would be doing greater and truer and stricter justice to the intentions and objects of the Society, and confer a much greater benefit on those engaged in the breeding, not the fattening (for they should be viewed and considered separately,) of animals than by encouraging, as the awards mostly do, the great and injurious evil of feeding breeding stock so over and preposterously fat.—*A breeder of Stock.*

Barn-door Fowls.—Crammed fowls are very nasty things: but '*barn-door*' fowls, as they are called, are sometimes a great deal more nasty. *Barn-door* would, indeed, do exceedingly well; but it unfortunately happens that the *stable* is generally pretty near to the barn. And now let any gentleman who talks about sweet barn-door fowls, have one caught in the yard, where the stable is also. Let him have it brought in, killed, and the craw taken out and cut open. Then let him take a ball of horse-dung from the stable-door; and let his nose tell him how very small is the difference between the smell of the horse-dung and the smell of the craw of his fowl. In short, roast the fowl, and then pull aside the skin at the neck, put your nose to the place, and you will almost think that you are at the stable-door. Hence the necessity of taking them away from the barn-door a fortnight, at least, before they are killed. One thing, however, about fowls ought always to be borne in mind. They are never good for anything when they have attained their full growth, unless they be *capons poullards*. If the poulets be old enough to have little eggs in them, they are not worth one farthing; and as to the cocks of the same age, they are fit for nothing but to make soup for soldiers on their march, and they ought to be taken for that purpose.—*Cobbet's Cottage Economy.*

Hydrophobia.—A copious draught of vinegar, morning, noon, and night, is said to be a cure for hydrophobia.

Miscellaneous.

THE KINGS OF THE SOIL.

Black sin may nestle below a crest,
And crime below a crown;
As good hearts beat beneath a fustian vest,
As under a silken gown.
Shall tales be told of the chiefs who sold
Their sinews to crush and kill,
And never a word be sung or heard,
Of the men who reap and till?
I bow in thanks to the sturdy throng,
Who greet the young morn with toil;
And the burden I give my earnest song
Shall be this—The Kings of the Soil;
Then sing for the Kings that have no crown
But the blue sky o'er their head;
Never Sultan or Dey had such power as they
To withhold or to offer bread.

Proud ships may hold both silver and gold,
The wealth of a distant strand;
But ships would rot and be valued not,
Were there none to till the land.
The wildest heath and the wildest brake,
Are rich as the richest fleet,
For they gladden the wild birds when they wake,
And give them food to eat.
And with willing hand, and spade and plough,
The gladdening hour shall come,
When that which is called the "waste land" now,
Shall ring with the "Harvest Home."
Then sing for the Kings who have no crown
But the blue sky o'er their head;
No Sultan or Dey had such power as they
To withhold or to offer bread.

I value him whose foot can tread
By the corn his hand hath sown:
When he hears the stir of the yellow reed
It is *more* than music's tone.
There are prophet-sounds that stir the grain,
When its golden stalks shoot up—
Voices that tell how a world of men
Shall daily dine and sup.
Then shame, oh shame, on the miser's creed,
Which holds back his praise or pay
From the men whose hands make rich the lands,
For who earn it more than they?
Then sing for the Kings who have no crown
But the blue-sky over their head;
Never Sultan or Dey had such power as they
To withhold or to offer bread.

The poet hath gladdened with song the past,
And still sweetly he striketh the string,
But a brighter light on him is cast
Who can plough as well as sing.
The wand of Burns had a double power
To soften the common heart,
Since with harp and spade, in a double trade,
He shared a common part.
Then sing for the Kings who have no crown
But the blue sky o'er their head;
No Sultan or Dey had such power as they
To withhold or to offer bread.

THE CORNISH GIANT.

From "The Book of the Axe."—By G. P. R. Pulman.

"Good marnin t'e, what be gwine to haa a tack at et, sir?" was the friendly salute of a rustic brother craftsman to us as we were porgressing through the meadows, towards the lower ground of the Axe, on a glorious day in April last.

"Good morning, my friend," said we—"such is our intention."

"Ah well! I wish ee luck, but I don't think you'll haa et, ver th nashun seyzid nit fullers hev bin out all thease blessid night. Lor! Lor! what a river this ood be, if twadd'n ver they baggerin proachers. Why th vish ed zo zwarm, and be za deucid fat and sassey, that ted be act'ly dagerous to walk bezide th stream wi'out a bull-dog or a p'liceman ta kip em off! Forty years agoo 'twas nothing ta lug out two 'r dree samman a day wi' th vly; and as ta th trammel, why I've a-bin ta th landin ov a putt load in two hours. You don't mind, but I do, when the Carnish Giant was lodgin up ta Axminster. Maacy wull, there was a man—ee stood zebb'n voot two, wi'out es shoes! A noted chap ver proaching was he. Bless yer soul, th vish did *sim* ta know en. Ee'd git inta ther huvvers za intimate as thof ee was a mermaid called ta zay "how d'e do;" but ee'd nivver lef wi'out kidnapping one er two o' th findist o'm wi' a bit o' coord rown th' tails—not he. When ee"d dive, the deepist hole in the riv[illegible]add'n deep enough ta cover'n. Ee'd turn auver, and go ta boddam, but there'd be es heels sticking up 'bove water like th spoon in a glass o' grog."

"The Cornish Giant must have been a wonderful fellow," observed we, interrupting our loquacious companion.

"God bless ee, sir, I b'lieve ee was too. I can tull ee th best bit o' fun about he that ever I zeed in my days—tis a rigglar annydote:—Ee lived in a ole ramshacklo houze that wadd'n much tallder than ezzulf; and as ta th palloul, ee coodn ver es life stan upright in en—no, ner nothin like et. Th up-stair flooring was rottid ta powder—I can't think how cood hang together under ee's waight. Wull! one marnin as ee was zitting ta brektus, tullin ta I about vishing and that, all ev a siddent vire was cried dru th streyts. I mine th time za wull as thof twas but yes'day—twas when th wold Sammy Amlin's vuzz-rick was destroyed. 'Es that vire I *hears*? zos ee. 'Iss,' zes I, 'and there goes agen.' Zes ee, 'burn out burn out, John, good gra———!' That's all I *yird*, ver ee was in sitch a vivrryation that ee jumped up all ta once, wi'out thinkin that ee was tallder than the room—het th toy-boord down, shotting th bwoiling wator auver ny two legs, and mekkin a houzevull o' shards wi' th cups and sassers; up he jumped wi' sitch vimment fo'ce as ta het es head bang dru the eyling, th floor, and up dru a voot above, inta th bed-reom where es sarvant maid was bad a-bed. Maacy pon me, there was a piece o' work! Th maid went inta tha 'sturricks; I had enough ta do ta hold vast my scald ligs, and laff and cry all ta one time; th giant hollar'd and hoop'd za loud as the dist and marter ed let er, to; in bust a lot o' fullers, *thinking*, vren th hallabelloo we made, that th vire was there; and yon nivver yird such laffin and roarin in your life as vollar'd their discovery o' us. I and th maid was soon restored, but twas dree hours, work ta git th giant's head out o' th hote ee'd a-made. Two caffinders was obliged ta be zend vor, and they zaw'd, an' zaw'd an' zaw'd, till ta last they zaw'd en out.'

Challenge Extraordinary.—*Steam versus Horseflesh.*—A gentleman, well known on the turf, has challenged the best engine belonging to the Great Western Railway Company, to run half a mile for 1,000 sovs., the steam to travel per rail, and the biped on the Reading Race Course, which is parallel with the line, and the only course in the kingdom on which such a match could come off. Should the company have the pluck to make the match, it would create great interest, and speculation would run high.—[We would back the horse for one half-mile.—Ed M.L.E.]

What a Gentleman may, and may not do.—He may carry a brace of partridges, but not a leg of mutton. He may be seen in the omnibus box at the opera, but not on the box of an omnibus. He may be seen in a stall inside at theatre, but not at a stall outside one. He may dust another person's jacket, but must not brush his own. He may kill a man in a duel, but he musn't eat peas with his knife. He may thrash a coalheaver, but he musn't ask twice for soup. He may pay his debts of honour, but need not trouble *himself* about his tradesmen's bills. He may drive a stage coach, but he musn't take or carry coppers. He may ride a horse as a jockey, but he musn't exert himself in the least to get his living. He must never forget what he owes to himself as a gentleman, but he need not mind what he owes as a gentleman to his tailor. He may do anything or anybody, in fact, within the range of a gentleman—go through the Insolvent Debtor's Court, or turn billiard-marker; but he must never on any account carry a brown-paper parcel, or appear in the streets without a pair of gloves.—*Comic Almanack.*

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