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D Spalding

NEWCASTLE FARMER.

VOL. III.—NO. II. COBOURG, OCTOBER 1, 1848. THOS. PAGE,—Editor.

BLIGHTS OF THE WHEAT.

CHAPTER IX.

In the first chapter of this little volume, the general habits of the fungi, as far as we are yet acquainted with them, are described at large. It will be interesting, however, to the agricultural reader to hear something more of the peculiarities of those which are found in the fields and gardens of this country. Hitherto but little accurate knowledge prevails respecting them, especially amongst the cultivators of the soil; and even men of science and patient botanical research have much to learn upon these subjects. In the various publications relating to the progress of that singular disease in potatoes that committed such ravages in 1845, remarks were made upon fungi, which showed that the authors of them had made no accurate observations with regard to the real characteristics of these singular pests. Every well-informed botanist at once detected these mistakes, and perceived that no practical advantage could be derived from the advice offered on such erroneous foundations. It has been already stated, that no good reason can be given for their constant appearance under certain circumstances, but the almost universal diffusion of their sporules, whose minuteness renders them capable of abounding in almost every situation. The difficulty is to conceive, floating, as they do, unseen in the atmosphere, how any place can be free from their presence. Nevertheless there have been speculators who, having marked their constant appearance on the same places of growth under similar circumstances, have ventured to conceive that they are the results of what is called spontaneous generation. Such persons think that certain conditions of matter give rise to vitality of the low kind found in these fungi, and that the same holds with regard to certain animalculæ and insects. This reasoning is opposed to all the soundest principles of inductive philosophy. The evidence, on the contrary, tends to the conclusion which has been previously announced. Innumerable myriads of sporules, finding suitable matrices, give rise to fungi; and innumerable minute eggs, similarly circumstanced, give birth to the animalculæ which have been attributed to these untenable causes. This opinion is further confirmed by the fact, that fungi are frequently absent when they might have been expected to have abounded. The reason is, that by some means or other the sporules have not found their way to the localities which otherwise indicate the conditions of their growth: consequently the expected fungi have not appeared. Mark the instance of preserved fruits, which generally give rise to certain moulds. If these are covered, no moulds appear; if left exposed to the air, they are almost sure to be developed. In the former case the sporules in the air were excluded; in the latter they found a ready admission. Again; if a match is burned immediately over a jar of some preserve, the moulds are said not to appear. The reason is, the oxygen has been consumed which has been essential to the development of these fungi, and, if the fresh air be excluded immediately, they cannot vegetate. Inoculation, also, of plants by fungi, militates against the notion of spontaneous generation. The true cause of their appearance is, undoubtedly, the existence in the atmosphere of the sporules as before stated: and when these find a situation of growth adapted to their nature, they vegetate and produce fungi.

The injuries we receive from such fungi are incalculable. We have already seen what mischief is done by them to our wheat crops. The loss to the possessors of silkworms from the same causes is often immense; and the dry-rot fungus, as every one knows, causes excessive damage both in our shipping and in our houses. We have, nevertheless, a grand compensation in the benefits conferred by the various tribes of fungi in clearing away the evils arising from decomposing organic matter. They do this good effectually by their unparalleled rapidity of growth, and by the quickness and facility with which they appropriate the putrescent effluvia of dead substances, and incorporate it into their own systems. Hereby escape into the atmosphere is prevented, and the consequent spread of numerous diseases. Nor ought the medicinal properties of fungi to go much longer without being further tried. Probably science will hereafter make them available for purposes of which, in its present condition, the practitioner has little or no conception.

So little is accurately known of the habits of minute fungi, even by the most curious investigators, that even the mode of growth of erysiphe, to which attention has been drawn by certain observations, cannot be said to be clearly known. As seen in certain vegetables, the curious fungi bearing this name, spring from a floccose web, and consist of little globules, which change colour as they grow older, generally ending in black. This web is filled with sacs containing sporules. The sacs put out curious fibres, which lift them up from the surface of whatever leaf they may grow on, and whose juices they imbibe as the source of their vitality. Before this appearance takes place there are to be seen threads, white or greyish, and consisting of bead-like joints, the uppermost of which, it has been asserted, fall off and vegetate on the plant. Abundant specimens may be frequently seen on the leaves of peach-trees. We know that it belongs to the fifth order, *(ascomycetes,)* because a good microscope shows us that its spores are in *asci*, or little vesicles. Mr. Berkeley believes that the various species of this fungus attack perfectly healthy plants. Still no botanist can positively state how it grows on any one of them. The best authorities think that it grows in the form of a mould, which is called by them *oidium*; and conceive that very possibly it makes its first appearance at the stomata. But nobody has found that its mycelium, or spawn, actually gets up into the leaves; for in its early stage it is a jointed mould, seemingly superficial. Now, when we find the hop, the bean, the pea, and the whole series of leguminous plants withering under the triumph of this disease year after year—when it is the pest of our beautiful peach-house, and even rages on some of our finest trees, as the sycamore—what a lamentable state of ignorance prevails, that we can say no more of it than has just been announced. Well might Sir Isaac Newton say to Halley, when speaking of science, "there is game in every bush, if you choose to beat for it."

Take again the various kinds of *botrytis*. There is hardly, on the face of nature, a more common fungus than this. For ages it has met the eye in innumerable fields. The produce is pronounced mouldy; there is an end of it. Scarcely any one has thought of investigating the matter further. In the spring of the present year (1846,) the botrytis of the vetch threatened destruction to an immense quantity of valuable produce, and this would have taken place had not the sun shone with great power. But ask almost any farmer what it is; he knows no more than those who have never seen it. It is enough for him that the plants are mouldy, and it cannot be helped. But science will introduce us to a better state of things. "Onions are mildewed," says the gardener. Does he know that this mildew is a botrytis, called "Destructor," from its ravages? Another botrytis is found on turnips, and another on nearly all plants where decay has decidedly commenced. Of all the kinds of botrytis, that which appears on the potato is perhaps the most remarkable; and its singular connexion with the disease of 1845, and again in 1846, will render it perpetually memorable. To say that the disease was caused by this fungus would be contrary to the best evidence, but that it attends and accelerates it is unquestionable. True it is that whole fields, in a sad condition of disease, were seen without a trace of botrytis; but in all contagion, infection, and inoculation, anomalies constantly occur. In most cases, the botrytis was certainly connected with the disease, and a description of its growth will be interesting to every reader. The threads of mycelium interwove themselves amongst the cellular tissue. They ran through the loose intercellular passages of the lower surface of the leaf with great ease, and the fungi emerged through the stomata. Drawings of these modes of growth will be found in Mr. Berkeley's paper, in the first volume of the Journal of the London Horticultural Society. They admirably illustrate the progress of this curious fungus, the mycelium of which was undoubtedly present in the potato plants. It is a remarkable circumstance, however, that this botrytis was found to grow with greater luxuriance on the diseased tubers, where the tissue is far more dense, than in the stems or leaves. That the mycelium of this fungus was contained in the diseased potatoes may be proved from the following singular circumstance: A quantity of silk was, during the early part of the spring of this year, (1846,) perceived to be greatly damaged by a white mould. On submitting a portion of it, for examination, to an individual eminent for a knowledge of fungi, it was at once pronounced to be the *botrytis infestans*, or mould of the diseased potato. The mystery was soon cleared up; for the silk had been dressed with starch from potatoes, and proved a favourable situation for the development of the fungus from the spawn that was in it. Growth in such cases is extremely rapid; and when a potato plant is attacked by the botrytis, of course the juices are consumed by it, the elaboration of sap in the leaves cannot go on, nor, from the stoppage of the stomata by its threads, can admission of air, or emission of any gas or fluid take place. It is certain that the disease which destroyed such quantities of the potatoes in America, Great Britain, and over the continent of Europe, has not yet been satisfactorily explained. Further researches in plants more recently infected may throw additional light on the important subject. Undoubtedly, in most instances the fungus appeared; and where it was not actually seen externally on the leaves, it seems to have exercised an influence on the tubers, which are, in fact, branches or stems under ground, as every botanist knows. Several other curious fungi have also been seen in the tubers, which have not yet been fully described.

Enough has been said to show the extreme importance of more complete knowledge of the habits of parasitic moulds, and of the circumstances favourable or unfavourable to their development. It is hoped that what is now about to be detailed on that subject, as the result of experiments, will be regarded as a step in the right direction. Such steps must form the commencement of all useful discovery. Sound knowledge seldom takes a great leap when it first comes amongst us: it enters by slow and sure movements. The light of genuine science first appears as a spark, which subsequently is fanned by industry into a flame; false speculations, on the contrary, are mostly a blaze of straw.

It is purposed, in pursuing these inquiries, first, to advert to the experiments made by Dutrochet, one of the most ingenious of French naturalists; and then to describe some that were made by the author, in the spring of 1846.

It may be known that if the sap of certain plants, as the vine for instance, be kept in glass vessels, certain filaments will soon be seen floating in it; but few persons are apprised of the fact, that these filaments are the mycelia of moulds. If solutions are made of gum, isinglass, or glue, the same kind of filaments will appear, and they also are the mycelia of moulds. From these mycelia, or specimens of spawn, there grow two species of moulds, one articulated, corresponding with the simplest form described in the first chapter, and the other having the threads from which they spring entirely destitute of articulations. The articulated moulds look under the microscope like strings of little pearls, and are therefore called *monilia*, from *monile*, a necklace, because necklaces are frequently so constructed. The non-articulated threads pass by the name of *botrytides*, because they produce botrytis fungi of different kinds. Dutrochet, aware of these peculiarities, instituted a set of ingenious experiments with a view to determine the properties of liquids favourable to the development of one or the other. He disclaims at the outset all idea of spontaneous, or equivocal generation, and attributes germination to the causes to which they have been before assigned by the writer.

The first thing he discovered was, that pure albumen is altogether unfit for the growth of any kind of mould. A solution of white of egg in distilled water, kept for a whole year, yielded no mould whatever, though placed in a damp situation, and in all the other conditions usually deemed propitious. This liquid was then taken, and placed in glass vessels containing an ounce each, and into every one was put a single drop of some acid. The acids applied were sulphuric, nitric, muriatic, phosphoric, acetic, and oxalic. In every case, after about eight days, articulated moulds, of the same microscopic character as common blue mould, with which almost every one is familiar, made their appearance. These beaded threads constantly grew under these circumstances; but if there was added more than a certain quantity of any of these acids, there were no results at all. The mixture was found to be too strong.

It next occurred to Dutrochet to try alkalis, instead of acids. Accordingly he dropped into the solution of white of egg in distilled water, a little caustic soda, and caustic potash. To his delight, after a longer time than in the other cases, he found that the mould which these mixtures yielded was invariably without articulations. Botrytides were always developed by these alkalis.

Hasty observers would have concluded from these facts that acids exclusively favour the growth of articulated moulds, and alkalis of those which have no articulations. Dutrochet, however, was not disposed to make any such incautious generalization, and tried two more curious experiments.

The first was, to mix fibrine of blood with a little liquor potassæ, or solution of caustic potash, in distilled water. The mould springing up in this case was not a botrytis, as might have been expected, but a beaded mould with articulations.

The next trial was to distil the juice of a lettuce, and to add to the distilled liquid a little phosphoric acid. Here again a result took place contrary to expectation, in the appearance of moulds without articulations. The distilled juice of the same lettuce which was used in the second experiment, when left alone, yielded no mould whatever.

Whenever, on the other hand, the distilled juices of any plants, such as peach leaves, laurel leaves, and others containing prussic acid, were left in a similar situation, they invariably were found to give rise to moulds. The reason obviously was, that the acid passed over in the act of distillation. Every vegetable juice on which experiments were made produced moulds, if it contained any acid whatever, even though not in sufficient quantity to redden vegetable blues, the most easy test of the presence of an acid in any substance. These beautiful investigations were detailed at length by Dutrochet in the "Annales des Sciences Naturelles," as long ago as 1834, but somehow did not attract the attention they merited.

The salts of potash in vegetable juices certainly seem, according to these experiments, to be favourable to the development of mycelium of moulds. It also seems, from other facts relating to this matter, that there is both a maximum and minimum of such salts requisite for preventing or facilitating their growth.

No neutral salts produced any effect; and this explains why albumen yielded no moulds, notwithstanding the soda it unquestionably contains, and which would have induced the expectation of their growth in that substance. The reason is, the soda in albumen is in the state of albuminate of soda, which is a neutral salt, and therefore, according to the experiments on neutral salts, no development of mycelium could arise from it. It is not unlikely that a closer investigation of these phenomena might lead ultimately to such a course of management as greatly to check the various fungi infesting the vegetable tribes, and therefore they have been brought in this place before the notice of the reader; it will be well if any person who has leisure and talent should be inclined to make experiments with this design.

Not the least curious of these interesting experiments of Dutrochet, were the effects of certain substances which he added to the original mixtures.

When mercury was added in its metallic condition, the growth of the moulds was neither impeded nor accelerated.

Red oxide of mercury, corrosive sublimate, and other salts of mercury, completely prevented all development of mycelium, and no moulds were seen.

But Æthiop's mineral, or sulphuret of mercury, allowed the moulds to vegetate freely.

As oxide of mercury prevented all growth, so oxide of lead, on the contrary, quickened it. The moulds were visible much sooner than before.

Oxides of iron, antimony, and zinc, were completely neutral in their effects. Their presence produced no difference whatever.

Again, oxides of other metals, as copper, nickel, and cobalt, did not entirely prevent the vegetation of the moulds; but they were much impeded by their presence, so that they grew and spread a great deal more slowly.

The proximity of any perfume always proves a complete antidote to the growth of every mould.

No doubt, upon long and accurate trials, many more curious facts would present themselves, which at length might be reduced to a sort of practical system, conferring great benefit on the community at large. Suffering as we do in our farms, our gardens, and in our houses, from moulds, such discoveries would prove of inestimable value. As an instance, it may be stated that flowers of sulphur dusted over the leaves of peach trees in forcing houses, and potatoes in frames, are found most effectual in preventing the growth of erysiphe on the former, and *botrytis infestans* on the latter. Why then may not more general remedies be revealed by experiments and inquiry, if conducted with patience and skill?

In order to verify the statements by Dutrochet, the author was induced to try a few experiments on a similar plan, in the spring of 1846. The results were sufficient to manifest that many curious, if not useful, facts would reward the patient investigator. His proceedings consequences shall now be stated.

He first tried the white of an egg in distilled water, and though he kept it where it was damp and dark for many weeks, not a vestige of any mouldiness appeared. The albumen, as he had been taught to expect, yielded neither botrytis nor beaded mould.

He next filled a small gallipot about half full with the same mixture, and added one drop of pure nitric acid. In the course of eight or ten days the surface was mouldy. On submitting this matter to the microscope it was perceived to be a mass of monilia, or articulated mould.

Oxide of lead was added to a similar gallipot, into which he poured a teaspoonful of the same nitric acid. No mould whatever appeared. There was too much of the acid.

A drop of sulphuric acid was added to a third gallipot, containing the same solution of albumen. In a month's time mould of the articulated kind began to show itself.

To a similar mixture Æthiop's mineral was added; and, to his surprise, there came an abundance both of monilia and botrytides.

The next experiment was of the same kind, except that the acid was acetic. Plenty of monilia grew on the surface.

Red oxide of mercury added to a gallipot containing the same mixture, totally prevented the appearance of any mould.

Red oxide of lead, on the contrary, quickened the growth of abundance of articulated moulds.

Caustic potash was next tried in the solution of albumen; and there came a quantity of botrytis, or non-articulated fungus, some specimens of which were white, and some coloured, as if tinged with cochineal.

These were all the experiments he had leisure to try, but they are quite sufficient to show what wonderful matters for inquiry are presented by these little fungi, and to create an expectation that a year or two of ingenious research would give rise to phenomena of the utmost interest to men of science. Nor would practical advantages fail to accrue. No man can say that out of the slightest apparent discovery we may not derive the greatest benefits. The simple circumstance of the deflection of the needle by a galvanic current, *carefully observed* and stated, has given to the world the electric telegraph. The discoverer of this apparently trivial fact never imagined that it would lead to anything like this. It teaches us to mark every secret nature unfolds to those *who diligently inquire into* the hidden things of truth. If families could but be persuaded to replace the frivolous amusements, which only promote vacuity of thought, and are no real sources of pleasure, by observations of things in the *world in which they move*, and would introduce the microscope in the winter evenings into their circles instead of silly games, how would our national taste and knowledge improve! Fortunately, the appetite for such recreations is on the *increase*, and *might become the* source of real edification. Philosophy would then be indeed to Christian minds—

> "Effusive source of evidence and truth,
> A lustre shedding o'er the ennobled mind,
> Stronger than summer-noon, and pure as that
> Whose mild vibrations soothe the parted soul
> New to the dawning of celestial day.
> Hence, through her nourish'd powers, enlarged by thee,
> She springs aloft, with elevated pride,
> Above the tangling mass of low desires,
> That bind the fluttering crowd; and, angel-wing'd,
> The heights of science and of virtue gains,
> Where all is calm and clear; with nature round,
> Or in the starry regions or the abyss,
> To Reason's and to Fancy's eye display'd;
> The *first* up-tracing, from the dreary void,
> The chain of causes and effects to *Him*
> The world-producing *Essence*, who alone
> Possesses being; while the *last* receives
> The whole magnificence of heaven and earth,
> And every beauty, delicate or bold,
> Obvious or more remote, with livelier sense
> Diffusive painted on the rapid mind."
>
> *Thomson.*

Some persons may smile at the notion of devoting their inquiries to the habits of a fungus; but fungi are the works of infinite wisdom, and nothing is made by infinite wisdom that has not claims for well-regulated finite intelligence.

Every organized substance is so framed as to illustrate certain great natural laws; and natural laws, well considered and understood, have power to *impress on the mind the most* striking moral lessons. The falling of an apple to the ground, by the force of such a law, awakened thoughts in the mind of Newton, that unfolded the glories of the solar system and the economy of the universe. *Let no one therefore despise what*, by a false comparison, we are accustomed to designate small or insignificant, for neither are epithets becoming the creatures of God, as applied to any of those things which he has made and adapted to his own *designs. The least thing, even a* mould, requiring the highest power of the microscope for its observation, can become in his hands, as we have seen, a mighty scourge or a transcendent benefit. Nothing is so small but that almighty power can *accomplish great ends by its instrumentality*; nothing is so weak but the strength of God can make it victorious; nothing is so feeble but that out of it at his bidding there issues might. Hence the minutest organized substances *which obey the laws which he has impressed upon* creation tend to His glory; and the study of them enables us to collect the treasures of real wisdom, and to improve our condition in the world.

From the Scottish Farmer.

INFLUENCE OF AN IMPROVED STATE OF AGRICULTURE ON THE SANATORY CONDITION OF A COUNTRY.

Exclusive of the advantages arising directly from an improved method of cultivation, derivable from an increase in the produce of the soil, and also from an improved quality, there are other benefits, not the least important, although of a more general character, which naturally flow from this circumstance. These are not generally recognised as the important objects to be gained on the progressive improvement of land, by those whose interests are directly involved, and consequently they are seldom or never taken into account.

In every country and nation, ancient and modern, in which civilization has found anything of a firm hold, its Agriculture might test both the extent and nature of the civilisation which existed, and whether it was calculated to increase, and become permanently beneficial to succeeding generations.

History records many instances of nations springing up into grandeur and magnificence, in a comparatively brief space of time; and again, these are seen to recede as rapidly into insignificance and oblivion, by the operation of causes existing in their own social polity, which frequently escape the observation of the historian, and also that of the political economist. This inference might be illustrated by contrasting the case of individuals with that of nations or communities. Many individuals have been known to attain to great riches in a short time, and have been reduced to poverty in a still shorter space. The cause, in many respects, is obvious: the wealth consisted more in appearance than in reality; the solid foundation was wanting to render the structure durable. It has been so with some nations, that have lived their brief period of power and prosperity, and have again sunk into a lower state than that of those petty states which they once could number as their dependencies. The history of Spain can say something in reference to this—from the discovery of America to the destruction of the formidable Armada. The gold and silver of South America were more sought after by those possessing anything of the spirit of enterprize, than the development of the internal resources of their native country. What this has led to may be inferred from the present state of Spain with regard to Agriculture, commerce, and general prosperity.

It has been affirmed that nine-tenths of the fixed capital of all civilised nations is invested in land and Agricultural undertakings;* and that probably two hundred millions of the human race follow Agricultural pursuits in some shape or form. From all that has been spoken or written about Agriculture, it seems to be the only sure foundation of wealth; it is not fleeting in its nature; and any nation which can boast of wealth and prosperity, without a national Agriculture, is always liable to the sudden inroads of poverty, famine, and disease. If an improved state of Agriculture exercises such vast influence over the social condition of a nation, it comes to be a question of importance how far does improved Agriculture affect the climate, and consequently the health of the people? Statistical accounts go to prove that the climate of a country is greatly meliorated by the general advance of Agricultural improvements. This can only be proved from the prevalence of those diseases which are well known to spring from the marshy and undrained state of the land. Many of the colonial possessions of Great Britain were formerly remarkable for their unhealthy nature, and not a few of them might be called the grave of Europeans. Demerara was formerly one of the most unhealthy of the British possessions in America, for fevers and diseases of various kinds; but the improvements in the general treatment of the land have contributed to render it more endurable to Europeans. This was known to be the case previous to Dr Shier's going there; and now the further improvements in draining, &c, that are going forward under his auspices, will certainly tend to render it more salubrious, consequently less destructive to human life.

The city of New York, in the United States, at one time was very unhealthy, before the land around it was brought into proper cultivation. The yellow fever—the frequent visitor of low marshy lands, especially in those countries where the heat of summer is very intense—carried off many of its early settlers; but now, in the improved state of the country around the city, no such thing as yellow fever is known. The enterprising character of its people has contributed largely towards this desirable end, which has flowed as a natural consequence from their labours, although it may not have been the ostensible object which the cultivator had in view at the time. New Orleans is well known as the haunt of the fearful yellow fever, which is so destructive in its ravages that the place is literally deserted for a certain part of the year. The great swamps that are so numerous in its neighbourhood, send up deadly exhalations which poison the atmosphere, from which arise fevers, agues, and various distempers destructive of human life. Such will no doubt prevail in these localities to a certain extent, till the progress of civilisation removes, by science and industry, the cause of such pernicious effects. Without that meliorating effect, which the cultivation of the soil has upon the atmosphere, few climates would be agreeable to the nature and habits of man.

In those countries, especially in Africa and America, where civilisation has made little progress, the land is generally in a state of nature. The great rivers and streams spread themselves without control over vast tracts of land, which, from their very nature, absorb and retain the water in such a manner as to form swamps and stagnant lakes. When the grounds lie low, and forests, thickets, and weeds warp themselves together, proper evaporation is prevented, and the beneficial influence of the sun is counteracted where such take place. The surrounding atmosphere, from these various causes, becomes impregnated with unwholesome vapours, considered by many to be a subtle poison, which, when taken into the lungs, is the cause of many of those diseases that have baffled medical skill, and terrified nations.

But the tide of civilisation seems to be the most radical cure for such pestilences. The efforts of man, prosecuted with skill and aided by science, in a short space of time, can produce a very great change. Stagnant lakes and marshes are drained; the very courses of rivers are changed, by high embankments; tracts of waste land, that produce nothing of any value are reclaimed, the soil of which, when broken up and exposed to the action of the air and the sun's rays, is completely changed in its chemical properties. The iron of the soil then attacks the oxygen of the air, and unites with it; but the oxygen matter of the soil robs the iron again of an atom of oxygen, which the iron again replaces from the never-failing source—the atmosphere. The large proportion of decaying vegetable matter in such formations is thus acted upon by the cultivation of the soil; deleterious gases cease to be given off; a free circulation of air is effected from the clearing away of those natural obstacles that had been accumulating for ages—the causes of disease and death to many of those who were incautious enough to expose themselves to their destructive influence.

Scarcely any one will doubt that the climate of Europe is milder now, and more salubrious, than what it was fifteen hundred or two thousand years ago; and even a marked change has no doubt taken place in a far shorter period, in consequence of the general march of Agricultural improvements. Many of the districts of North America have experienced a change for the better, by the advance of civilisation, the clearing away of the forests, the draining of the land, and the bringing into proper cultivation that which is thus rescued from a state of uselessness. But it is also affirmed, that a climate may be injured by the cutting down of its forests, by lessening the quantity of moisture which is given off into the air by evaporation from the leaves of the trees. It has been said that the sultry atmosphere and the dreadful droughts of the Cape de Verd Islands are attributable to this cause; and it has been also said, that Greece, Italy, and various other countries have deteriorated in climate, by the clearing away of their forests. There is no doubt that forests sometimes

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[*] Johnston.

give shelter to extensive tracts of land, which otherwise would be exposed to the hot winds of summer and the cold winds of winter—the temperature of which depend principally on the direction from which they blow, and the surface over which they pass. I should be very apt to doubt that the cutting down of the trees tends to injure the climate of a country, by lessening the quantity of rain, as has often been affirmed; for if this were true, then the progress of Agriculture would tend to render the climate unfavourable, both to the growth of plants and to the general welfare of man. That improvements in Agriculture alter the climate for the better, has long been established. The following quotation from Professor Johnston's Lectures illustrates this inference :—'I may quote, in illustration of this fact, the interesting observations of Dr. Wilson, on the comparative state of health of the labouring population, in the district of Kelso, during the last two periods of ten years. In his excellent paper on this subject, in the "Quarterly Journal of Agriculture," he has shown that fever and ague, which formed nearly one-half of all the diseases of the population, during the former ten years, have almost wholly disappeared during the latter ten, in consequence of the general extension of an efficient drainage throughout the country; while, at the same time, the fatality of disease, or the comparative number of deaths from every hundred cases of serious ailment, has diminished in the proportion of 4.6 to 2.59.'

In addition to the improvement which is felt in districts, by an effective drainage, and other Agricultural advances towards a scientific system, an indirect influence is also exercised over the health of cities and towns, from the same cause. The manures of the large cities, so valuable in farming operations, is speedily removed to the open country from the narrow lanes and confined streets; and more trouble and expense are given to secure such matters for the Agriculturist—whose success in a material degree depends upon the quality and quantity of manure with which his fields are treated annually—thus taking away from the city that which might prove pestilential in its nature, were it allowed to remain amongst a crowded population.

From the Farmer's Gazette.

EXTRACTS FROM PROFESSOR ALLMAN'S LECTURE ON INSECTS INJURIOUS TO AGRICULTURE.

Before we take up the insect plagues individually, I shall request your attention for a very few moments, while I endeavour to make you acquainted with some of the principal characters which are common to all insects, and by which they stand out as a distinct group among the other members of the animal kingdom.

First, then, all insects are *invertebrate* animals—in other words, they are deprived of a true brain and spinal chord, their nervous system being of a comparatively simple type, though, as we shall presently see, they present us with instincts more extraordinary than are to be found, perhaps, in any other animal, leading us almost involuntarily to attribute to them an amount of intelligence not inferior to what we find in some of the most highly organized of the animal creation; their bodies are, moreover, divided into a number of rings or segments, a peculiarity which has given rise to the name *insect*, from the Latin word *insectus*, cut-in. All the true insects have exactly six legs in their perfect state, and the head is furnished with a pair of *antennæ*, or horns, while by far the greater number are provided with wings, which, though not absolutely universal, must be viewed as constituting one of the most striking characteristics of the class.

Insects breath by means of a most elaborate apparatus of curiously constructed tubes, which open upon the surface by a certain number of apparatus, called *spiracles*, and then branch through all parts of the body with a wonderful degree of minuteness, conveying the air into the most remote recesses of the animal, till the insect becomes, as it were, saturated with air, almost as a sponge may be saturated with water.

after lime has been added; and clay soils, in which little or no lime can be detected, are often entirely changed by the addition of lime. So, also, it may usually be laid with profit upon soils formed from decaying granite, while its action is frequently less sensible when applied to soils of decayed trap. This is chiefly because the granite contains little lime naturally, while the trap-rocks for the most part abound with it.

These practical considerations all lead to the conclusion, that *lime is really indispensable to the fertility of the soil.*

5. This conclusion, drawn from experience, is rendered certain by the fact, that all the crops we raise contain lime, which they derive solely from the soil. To this fact I shall hereafter more particularly advert, when treating of the purposes served by lime in the soil.

WHAT QUANTITY OF LIME MAY OR OUGHT TO BE PRESENT IN THE SOIL?

It is an exceedingly difficult point to determine the limits within which the proportion of lime in a soil ought to be kept, in order to maintain the highest degree of fertility. So much depends upon the proportions of the other ingredients of the soil—upon the quantity of sand, of clay, or of vegetable matter it contains—that the peculiar nature, both chemical and mechanical, of almost every soil would require to be studied in order to know how much lime it ought to contain, or how much may be safely added to it with the hope of a profitable return. Sandy and peaty soils, when dry require less than such as are naturally heavy or undrained.

We know that the limits are really very wide within which the proportion of lime in the land may be kept without preventing it from growing good crops; but there are three questions in regard to these limits, to which the practical man is interested in obtaining satisfactory answers:—how *much* may be present in the soil, or how *little*, without rendering it unproductive? and what proportion *ought* to be present, in order to make it fertile in the highest degree?

1. *How* MUCH *may be present?*—I have alluded, in a previous article upon this subject, to the practice of deep ploughing in the chalk soils of Surrey and the neighbouring counties. When from five to seven inches of pure chalk are brought up, and mixed with an upper soil only six inches deep, it is obvious that the quantity of carbonate of lime in the mixed soil must be very great. And since those soils so deepened become, under skilful management, more productive than before, it is obvious that the presence of a very large proportion of carbonate of lime will not alone prevent any soil from yielding good crops.

Through the kindness of Mr. Hewitt Davis, in sending me a portion of the surface soil of such an improved chalk-field near Croydon, I have been enabled to analyse it, and have found it to contain forty-one per cent. of carbonate of lime in the form of crumbled chalk.

The natural soil of the plains of Athens, analysed in my laboratory, contains also nearly as much lime, as appears from the following statement of its composition :—

SOIL FROM THE PLAINS OF ATHENS.

Organic matter	5.75
Salts, soluble in water (common salt and sulphate of soda,)	0.20
Sulphate of lime (gypsum,)	0.18
Oxides of iron,	2.91
Alumina (soluble in acids,)	2.35
Carbonate of lime (finely divided limestone,)	38.08
Carbonate of magnesia,	0.73
Phosphate of lime,	0.03
Insoluble siliceous matter,	50.333
	100.563

This soil *produces excellent crops of wheat*, but is liable, when the dry season comes, to be covered over with a crust of saline matter, which prevents it from growing grass. It contains very nearly as much lime as the chalk soil of Mr. Hewitt Davis. We conclude, therefore, that as much as two-fifths of the whole soil may consist of carbonate of lime, without its being by this cause rendered unproductive.

2. *How* LITTLE *may be present.?*—It is more difficult to say how little lime may be present without materially affecting

The body of all true insects is divisible into three distinct regions. The first of these is the *head*, and bears the antennæ, eyes and mouth, with the various masticatory organs.—To the head succeeds the *thorax*, which supports the organs of locomotion—namely, the six legs and the wings; and the remaining regions is called the *abdomen*, and contains within it the digestive and other viscera.

But of all characteristics of insects, there is surely not one so striking, so full of interest, so in every way worthy of arresting our attentions as the extraordinary changes they undergo from the time they leave the egg till they arrive at maturity. This phenomenon is called the metamorphosis of the insect, and is altogether so wonderful, and possesses in many respects so important a practical bearing on the applications of entomology to agriculture that I must devote a few moments longer to elucidation. For this purpose let us take as an example the metamorphosis of a butterfly or moth, an order of insect in which the changes are generally presented with great distinctness, and which, from the large size of many of them, and the facility with which they may be reared under our own eyes, are well adapted for observation.

As soon as the period arrives when the parent insect is to deposit her eggs, guided by an unerring instinct, she selects the plant or other substance on which her progeny, after escaping from the egg, are to be nourished; and having thus got rid of her burden, the great object of existence is accomplished, and she generally dies shortly after. The eggs, after a variable period, are hatched, and the young insect comes forth in the form of a little, voracious, creeping worm or caterpillar. In this stage it is called the *larva*, and it now commences eating greedily, and grows rapidly in size till at last it becomes too large for its distinded and over-strained skin, which finally is unable to contain the corpulant body of its owner, and, splitting along the back, frees the voracious larva from its restraint. But a new and more capacious skin has already been formed beneath the old one, and the larva loses no time in returning to his labour of eating and growing, till he is again too large for his skin, and the old process of moult has to be repeated; and this casting of the skin occurs at several successive periods during the life-time of the larva.

At last a more inportant change approaches. The larva loses all at once his gluttonous propensities, and seems to prepare for a long sleep. Some fashion for themselves now a curious little case, called a *cocoon*, in which they may rest secure during the period of their repose; while others merely sling themselves, by fine silken threads, to some neighbouring body, or hang by muscle-hooks, with which they are endowed for the purpose. Some penetrate at this period into the earth; some secrete themselves under stones; some lie concealed in the crevices of old walls, or in hollow stems, or in perforated timber, or in leaves curiously rolled around them—in short, the almost endless devices for concealment and security which insects adopt at this period would afford matter for a volume.

When everything is now ready, and all secure against molestation, during the period of repose which is to follow, the larva casts his skin for the last time, and now there appears, instead of an active, voracious caterpillar, with a soft, flexible skin, a production which one might, at first sight, hesitate to refer to the animal kingdom at all. It is an irregularly oval body, generally much contracted in length, clothed with a hard, dry shell, without any mouth, and totally deprived of all power of locomotion. It is called the *pupa* or *chrysalis.*

In this state, plunged apparently in a deep sleep, the insect may remain for an indefinite period, which varies with the particular species and the season of the year Strange developments, however, have been going on all this time within the rigid and opaque walls of the chrysalis, and, at last, the destined moment has arrived when the enchantment must be dissolved, the moment for which all that has hitherto come before us has been but a preparation—the walls of the chrysalis are burst asunder, and there issues forth, not a crawling and voracious larva, with gross appetites and an organization chaining it to the ground, but a bright and glorious being, whose empire is the sun-beam and the air, with rapture in its motions and the hues of heaven on its wings.—This is the *imago*, or perfect insect; it lives through a few summer months, deposits its eggs, and dies; while these give birth to larvæ, and thus repeat the mysterious series of metamorphoses.

But I find that I have been led by the interest and beauty of our subject, to wander somewhat farther from the rigidly practical than I am justified in doing; and I also know well, that to many of my auditors I have communicated nothing new. I believe, however, that there are others in this room whose minds have never yet been directed to such pursuits, and knowing the necessity of an acquaintance with the facts thus imperfectly brought before you, for a proper understanding of what is to follow I was of opinion that I could not with safety altogether pass them by, and, thus prepared, we shall now, without further preliminaries, enter on the more immediate subject of the present lecture.

I doubt not that I address myself to too many in the present meeting whose turnips had no sooner shown themselves above the ground, with their two little, smooth leaves, than they rapidly disappeared, and, after all the pains and expense bestowed on the preparation of the soil and the sowing of the seed, the greater part, or perhaps the entire of the crop has perished.

On making inquiry as to the cause of the failure, I will doubtless be told that the mischief must be laid to the account of "the fly." But are you quite sure that you know what this terrible agent you call "the fly" really is? Are you well acquainted with all its habits? Are you quite certain that in your attempts to destroy it, you do not mistake for it some perfectly innocent, or perhaps useful insect? I shall now endeavour to place you in a position from which you may answer all these questions in the affirmative.

The turnip-fly, as it is not very correctly called, is a minute coleopterous insect or beetle, by which is meant an insect whose wings are folded up beneath a pair of hard, horny sheaths or wing-cases. The scientific name of the turnip-fly is *Haltica*, which is derived from a Greek word signifying to leap, because the moment you approach the little insect it springs away, to escape being captured, and if you examine it with a very little attention, you will perceive that the thighs of the hind legs are remarkably thick, a provision which is intended to afford room for the powerful muscles which are contained in the interior of the thigh, and which enable the Haltica to perform its extraordinary leaps.

Two different species of Haltica infest our turnip fields: one, which is the more abundant, is of a shining black, with a broad, yellow band running down the middle of each wing-case. It is called *Haltica nemorum*. The other is of a somewhat more globular form, of a greenish black, with a brassy or coppery hue, and not furnished with the yellow bands upon the back. It has been named by naturalists *Haltica concinna*.

[Mr. Beamish here stood up and produced some specimen, of the turnip fly, which he had preserved in his watch case which attracted the attention of the meeting.]

Having thus made yourselves familiar with the appearance of the perfect insect, the next point to be attended to is its habits. It is the Haltica nemorum, whose habits have been properly investigated by naturalists, and to this, therefore, what I am about to tell you strictly applies, though there can be scarcely any doubt that the habits of the other species are almost in every respect similar.

During the whole of the summer and part of the spring and autumn months, the parent turnip-fly may be seen upon the rough leaves of the turnips, looking out for a spot on which to deposit her eggs. For this purpose she selects the under surface of the rough leaf, and in about ten days after the eggs are laid the young *larvæ* escape from them. These are in the form of little whitish worms, and so minute as to be almost invisible to the naked eye. They no sooner leave the egg than they bite through the skin which covers the under surface of the leaf, and burrow winding passages through the pulp, between the upper and lower skin. In this way the interior of the leaf will be ruined by numerous burrows, the little larva feeding on the pulp, and increasing in size as it proceeds, while, at the same time, the parent beetle will be at work, eating round holes through the whole thickness of the leaf.

From all this, however, agriculturists has nothing immediately to dread; the turnips being now in the rough leaf are strong enough to care but little for the attacks of the beetle and its larva, and though the leaves may be considerably ruined and perforated, the farmer has nothing to fear for crops from the Haltica.

After burrowing between the two skins of the leaf for about sixteen days, the period arrives when the larva must change to the pupa or chrysalis. It now, then, abandons the leaf and descends to the ground, in which it buries itself at a depth of about two inches, and undergoes its metamorphosis into the pupa.

In this state it continues without food or motion for about a fortnight, when it finally emerges as a perfect beetle, with other and more important duties to perform in the economy of nature.

The perfect Haltica, unlike what we witnessed in the butterfly, is as voracious, or even more so than the larva; and it is in the perfect state that the agriculturist has alone to dread its ravages.

It seldom happens, however, that any injury can be inflicted by the beetle at the time of its emergence from the pupa, for the turnips are then almost always quite strong enough to suffer its attacks with impunity.

The turnip-fly continues feeding on the rough leaves of the turnip till the commencement of winter, and then it shelters itself from the severity of the season beneath the loose bark of trees, and under stones and fallen leaves, and in moss and hollow stems, where it *hypernates*, or falls into a state of torpor, during the winter months. But on the return of spring, with the first gleam of sun, they issue from their hiding-place, and may now be seen in multitudes basking upon walls or dry banks, or in sunny nooks, ready, the moment the turnips are over ground, with their tender, smooth leaves, to fall on them and devour them.

Such is the history of the turnip-fly; we are indebted for it to the united labours of many distinguished entomologists, but to no observer are we under so many obligations for our knowledge of the economy, not only of this little plague, but of the other insects injurious to agriculture, as to Mr. John Curtis, and Mr. J. O. Westwood. Of the writings of the former distinguished entomologist especially, I have not hesitated to avail myself freely in the compilation of the present lecture.

Let us, in the next place, see what remedies we can suggest against the attacks of the *Haltica*, and we will now find what important assistance the knowledge of the facts just laid before you will afford in this part of our inquiry.

We have seen that when once the turnip has passed from the smooth into the rough leaf, that it is comparatively safe from injury; hence, one of our principal objects should be to hasten this passage as much as possible. It must be quite apparent, that, to promote such an object, the grand rule is to have your land properly prepared—in that condition, in short, which experience has pointed out to you as the best adapted to promote a healthy and luxuriant vegetation. It is no part of my intention to enter into details upon these practical points; you know them yourselves much better than I do; my object is to lay down general principles, deduced from scientific observation: it is for you to carry these principles into detail.

I may here mention, however, that hand manure, such as guano, put in at the time of the sowing, has been found very effectual in promoting the rapid growth of the plants—a fact, in truth of which I may urge the experience of my friend, Mr. Ball, to whose exertions we are so much indebted for the success of the present meeting.

Another important rule is to sow thickly, and let all your seed be of the same age, so that it may come up uniformly.—It is found that thick sowing promotes the rapid growth of the young plants, and, moreover, when these are thick in the ground, even when the fly does attack them, you will generally have plenty left to constitute, after thinning, an abundant crop.

We have seen that the larva enters the earth to become a pupa, and when we have reason to suspect that these are in the ground, they may, perhaps, be effectually destroyed by deep ploughing, for by this means the pupa, whose natural position is only two inches below the surface, will be deeply buried beneath the furrow, and being thus deprived of the proper supply of air and heat, will necessarily perish.

Burning, also, when it can be adopted, has been found successful in destroying the pupæ.

Lime and soot have been used, but with doubtful success.

Mr. Curtis recommends the destruction of all those weeds which belong to the same natural family as the turnips, for these are in luxuriance long before the turnip is above ground, and harbour and support the *Haltica* till the turnips are ready for its attacks—an excellent suggestion, from acting on which I doubt not much benefit would be derived.

Besides the methods now mentioned, others have, from time to time, been practised, such as drawing a freshly-tarred or painted board over the field, when the fly, being disturbed, will spring up and stick to the board. In this way, it is said, multitudes may be destroyed.

Time, however, will not permit us to dwell longer on this subject, and I now only impress on you, that the grand reliance of the agriculturist must be on thick sowing, and the promotion of a rapid and vigorous growth in the seedling. If this be carefully kept in mind, I believe he need fear little from the *Haltica*, though from ignorance the most fatal results have followed, as, for instance, in Devonshire, where, in one year, the loss sustained by the agriculturist, from the *Haltica* alone, is stated by Young to have amounted to £100,000.

[Here Mr. Beamish rose and said, that he adopted the plan of steeping his turnip seed in train oil for 24 hours, and dried it with sulphur, and sowed but 4 lbs. to the *statute acre*. He found when the seed was bursting up that the flies were jumping in myriads about and among them, and that they did not attack a single plant. He has 40 acres of turnips this season.]

BLACK CATERPILLAR.

Fortunately for us the visits of the *black caterpillar*, which I am now about to bring before your notice, take place, for the most part, only with long, though irregular intervals of absence. Were it otherwise, so great are the ravages committed by this scourge, that the cultivation of the turnip would, in all probability, be abandoned.

The first recorded visit to these islands of the black caterpillar which, as we shall presently see, is the larva of a saw-fly, and is known in different parts of England by the names of Black Palmer, Black Jack, Nigger, and some others equally significant, occurred in the year 1756. Since that time the turnip crops in England have had several visits from it, but since the year 1782, when it was, for the first time, accurately described by Mr. Marshall, its greatest ravages seem to have been committed in the year 1835. "In walking through the turnip fields,' says Mr. Curtis, alluding to that year, "the most casual observer must have been struck by the mere skeletons which the leaves often exhibited, the fibres only remaining, the membrane being entirely consumed." "In July Mr. Manning had 24 acres of English turnips quite destroyed, at Elton, in Bedforshire, except about 2 acres which were not hoed out. On Saturday morning," he says, "I first noticed the caterpillar very numerous, about three weeks after the turnips were up, growing luxuriantly and looking well.—On Monday part of the field which had been hoed about four days was entirely destroyed, and so they went on with this work of destruction, which was the most complete I ever saw." "Mr. Saunders states that he never witnessed so great a destruction of turnip fields by the black caterpillar as he did in August, near Dover. Very few fields had escaped, although some were less damaged than others, and the ravages were not confined to particular spots, but were evident in places far apart; that, in many instances, scarcely a vestige of green remained, and the tendrils and nerves, which they at first refused, became in the end necessary for their subsistence." "At Compton, in Surrey, a turnip field of 8½ acres was completely demolished; and a thunder-storm, accompanied by heavy rain, destroyed myriads of the larvæ, so that basketfulls of the blacks might have been swept up the following morning. At Long Ditton, Ham, and Guilford their ravages had been equally severe; indeed it was difficult, perhaps, to find a turnip country that had not been visited by these black armies; even as far north as the county of Durham they had proved very injurious to this crop; and in Essex, Bucks, Kent, Sussex, Hants, Wilts, Dorset, and Somerset the turnip crop was altogether a failure, for the produce of a second, and even a third sowing was consumed by them."

The agent in all this fearful devastation is the larva of a four-winged fly belonging to the family of the *tenthredinidæ*, or saw flies, and known to naturalists by the name of *Athalia spinarum*. In the years when their greatest ravages were committed, the flies were observed coming from the north-east in amazing multitudes, sometimes forming "clouds so as to darken the air." It will be seen from what has just been said, that while it is only in the seedling state of the turnips that this crop is exposed to any formidable danger from the *Haltica*, there is no period of its growth in which it may not be attacked and demolished by the *black caterpillar*.

The most careful observations on the economy of the turnip saw-fly have proved to us that the female fly deposits her eggs in little slits which she forms in the margin of the rough turnip-leaf, between the upper and under skin of the leaf.—She will lay from 250 to 300 eggs, and these will be hatched in from five to eleven days. From these eggs proceed the *black caterpillars* which are at first not more than a tenth of an inch in length, and of a colour nearly white. In less than two minutes after their escape from the egg, their voracious propensities manifest themselves, and the little larva begins to devour the under surface of the turnip leaves. They now grow rapidly in size, becoming more and more destructive every day; and after changing their skin three times, they have acquired a dark slate colour, and are three-fourths of an inch, or even one inch in length. Soon after this their voracious propensities cease, and being now about three weeks old, they descend from the leaf and bury themselves in the ground, at a depth of one or two inches. Here they weave for themselves a little oval cocoon or cell, rough and brown on the outside, from the adherence to it of particles of clay and sand, but of a beautiful silvery whiteness within. In the cocoon they change to a pupa, and in this state remaining for about three weeks in summer, though the late broods often remain the whole winter under ground, they finally emerge as a perfect saw-fly.

It will be seen that between the insect just described and the *Haltica* an important difference exists, in the fact, that while it is the *perfect insect* of the *Haltica* that does all the mischief, in this the ravages are wholly committed by the *larva*, the perfect insect being utterly incapable of doing any harm.

Though we have not, I believe, as yet any record of the black caterpillar laying waste the labours of the agriculturist in Ireland, yet this may easily be accounted for, when we recollect that the cultivation of the turnip to any extent in this island is comparatively recent, and we are certainly by no means justified in considering ourselves secure from future visits of this scourge; so that it is of importance that we should be prepared to meet it when it may happen to arrive.

Numerous remedial measures have been, from time to time, proposed and practised against the attacks of the black caterpillar, such as the strowing of quick-lime, coal-ashes, and soot; passing a heavy roller over the field in the evening or night, provided the plants are not too far advanced to escape injury from the roller; shaking off the caterpillars, by means of a rope drawn over the turnips by two men; sweeping the plants with bushes, &c. Each of these modes has been partially successful; but perhaps the chief reliance must be placed in hand-picking and in the use of ducks and poultry. Mr. Sells has shown that 10 or 12 children, from 6 to 10 years old, might easily collect 90,000 or 100,000 caterpillars in a week—a remedy which here ought certainly to be no difficulty of applying in Ireland.

But no method seems to have been so effective in England as the turning of large flocks of ducks and poultry into the infested fields. These birds feed on the black caterpillars, and devour them in such quantities as very soon to put a stop to their ravages. Nearly 400 ducks were at work at one time on two farms in Norfolk, and saved all the turnips committed to their care.

I have thus detained you long enough with the history of the turnip saw-fly and its larva the black caterpillar; and now hasten to the discussion of another insect, by which the most serious injury has been inflicted on the crops of the agriculturist.

From the Journal of Agriculture.

THE USE OF LIME IN AGRICULTURE.

BY PROFESSOR JOHNSTON.

The practical Farmer in nearly all countries, has been accustomed to add lime to the soil; but can lime not be dispensed with? Is there no improved mode of culture by which the use of lime may be superseded? There are several considerations from which an answer may be drawn to this question.

1. Extensive and prolonged experience has shewn that the fertility of many soils is increased by the regular addition of lime—that the surface of whole districts even is sometimes doubled or trebled in value by the addition of lime alone—and that, if it be for a series of years withheld, such soils become incapable of producing luxuriant crops.

2. All naturally fertile soils are found upon analysis to contain a notable proportion of lime; while in many of those which are naturally unproductive, the proportion of lime is comparatively small.

3. A naturally productive soil, even though regularly manured, is often found after long cropping, to become incapable of growing particular crops in an abundant or healthy manner. On analysis, these soils are not unfrequently found to contain only a very small proportion of lime. After an addition of lime to such soils, the diseased or failing crops often grow again healthily and in abundance.

4. Lime added to one part of a farm sometimes produces no visible effect, while upon another it greatly increases the produce. In such cases, a chemical analysis not unfrequently shews, that those soils or fields on which it produces no effect already contains a sufficient supply of lime, and in the state most favourable to fertility.

Thus barren sandy soils often admit of profitable cultivation the fertility of the soil. The nature of the surface and under soil of a field, the circumstances in which the field is placed, and the kind of cropping to which it is subjected, all materially affect this question.

a. Thus, if the upper soil abound in vegetable matter, the proportion of lime cannot be diminished to so great a degree without affecting its fertility—while, if the under soil abound in lime, so large a proportion may not be absolutely necessary in the surface.

b. The circumstances in which the field is placed will influence the proportion of lime that is absolutely necessary. Thus, if springs arise in it, the waters of which contain lime—or if waters impregnated with lime flow from the adjacent rocks or hills, as is the case where marl beds are formed—or if the yearly rains wash down into it from the higher grounds the lime which they contain—these circumstances may give such a constant supply of lime to the land as to render unnecessary the permanent presence of a large proportion in the soil of the field itself. It is necessary that the effect of such local circumstances should be, in all cases, taken into account; otherwise analysis might sometimes lead us to suppose, that a much smaller proportion of lime may be present, without injury to the soil, than is really required, where no such supplies are naturally brought into it, to keep it in an average state of fertility.

Thus Springel found, upon analysis, that the rich marsh lands of Holstein and East Friesland contained only a minute proportion of carbonate of lime; the

Marsh lands of Holstein only	0.2	or one-fifth per cent.
The salt marshes of East Friesland,	0.6	or three-fifths per do.

But we should be wrong were we to conclude that, because these lands bore rich and fattening pastures, therefore this small proportion of lime is sufficient to make every land bear good grass. The floodings to which these lands are subject, or the supplies of water that are constantly brought into them from beneath, no doubt contribute, in a considerable degree, to the permanent richness of the grass they bear.

It appears, however, from these analyses, that, under certain circumstances, a very small proportion indeed may be sufficient to keep the land in a state of permanent fertility.

c. But something also depends upon the kind of crops we wish or continue to grow. It is possible that grass land kept in pasture may require less lime than arable lands; because the roots of the grasses are small, branch out in every direction so as to come into contact with a large proportion of the soil, and remain in the land the whole year through, collecting their food from the soil. In the soil of a field of old grass land in the neighbourhood of Durham, I found only 1.3 per cent. of carbonate of lime; and numerous soils from the dairy county of Chester have given me considerably less than 1 per cent.

Yet when such land is ploughed up, though it may give one or more good crops by the aid of the decaying vegetable matter of the turf, it will soon refuse to grow healthy crops of corn or oats, and will certainly not yield large green crops, unless lime be added in greater or less proportion.

I have already alluded to the fact, that crops become diseased—grow up, perhaps, well at first, but afterwards assume a sickly appearance, or fail altogether—when the proportion of lime in a soil becomes very small. This is true of every kind of soil in almost every part of the world, and in reference to almost every crop. The first of the following soils was sent to me with the statement that for four rotations the turnips had come up well, but in the autumn had always become diseased, rotted and failed, and a remedy was asked; on the second, barley came up well, but afterwards failed; on the third, from Jamaica:—

	Pinkle near Edinburgh.	Lynedoch, Perthshire.		Jamaica.
		Soil.	Subsoil.	
Organic matter,	6.69	10.03	2.05	9.59
Salts soluble in water,	1.07	trace	trace	1.16
Oxides of iron,	6.91	3.02	5.12	3.21
Alumina,		2.56	2.23	1.16
Sulphate of lime,		0.44	0.14	
Carbonate of lime,	0.31	0.30	0.37	0.38
Carbonate of magnesia,	trace	trace	trace	trace
Oxide of manganese,	0.24			0.07
Siliceous matter,	84.58	83.37	88.20	84.31
	99.80	99.72	98.11	99.88

In all these soils, and especially in the first and third, the proportion of lime in any state of combination is very small: and though each case required other special remedies also, I recommended, among the measures to be taken with the view of rendering them productive, the addition of lime in one form or another to them all.

I consider therefore, that these soils contained less than arable land, which derives no supply from any natural source, *ought* to contain, if it is to produce healthy and abundant crops.

3. *How much* OUGHT *to be present?*—To maintain a soil in the highest state of fertility, it need not contain so much as was found in the chalk and Athonian soils above described, nor should there be so little in it as was present in those from Pinkie, Lynedoch, and Jamaica. Those soils which are naturally most fertile in regard to *all* our cultivated crops, usually contain a considerable larger quantity than was present in these latter soils,—while those which naturally contain so small a proportion are almost universally improved by an addition of lime. Still, scarcely any proportion can be stated which will be really the most advantageous for any considerable number of different soils. As a matter of opinion, however, I may state that I believe there are few soils in our climate to which lime, in the proportion of, or in quantity equal to, three per cent. of the carbonate will be too much; while, on the other hand, there are not many in which it will be of advantage to increase the proportion of carbonate beyond from six to ten per cent., *provided this carbonate be in a sufficiently minute state of division.*

So much, however, as I have already said, depends upon the nature of the soil—its locality, its stiffness, the state of drainage, the proportion of vegetable matter and of salts of iron it contains, and upon the states both of chemical combination and of mechanical division in which the lime exists in the soil—that I should consider it necessary to inquire into all these circumstances in each special case, before I ventured to give a decided opinion as to the amount of expenditure of lime and money for which a profitable return was likely to be obtained.

From the Gardeners' Chronicle.

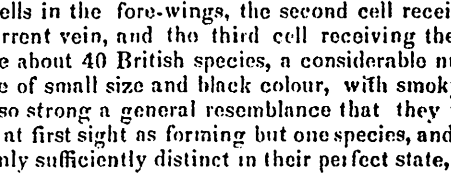
ENTOMOLOGY.

THE SAW-FLIES OF THE PEAR AND ROSE-LEAVES.

In no branch of natural history is the minute and careful examination of specific characters, as well as precision in the investigation of the economy of species, more requisite than in entomology, and it is on this account especially that it is worthy of engaging the attention of the young, as a means of attaining habits of precision and observation, which cannot fail, in after life, of being highly serviceable.

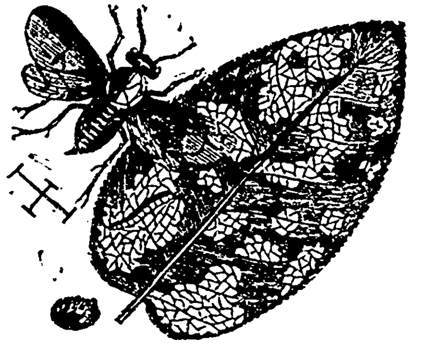
Selandria is a genus of saw-flies distinguished by having nine joints in the antennæ, and by having two radial and four cubital cells in the fore-wings, the second cell receiving the first recurrent vein, and the third cell receiving the second. There are about 40 British species, a considerable number of which are of small size and black colour, with smoky wings, bearing so strong a general resemblance that they would be regarded at first sight as forming but one species, and yet they are not only sufficiently distinct in their perfect state, but their habits in their preparatory stages are also dissimilar, at least in such as have been observed.

One of these black species was first described by Reaumur, (Mémoires, vol. 5, tab. xii., figs. 1—6) as feeding in the larva state upon the leaves of Pear trees, as well as upon the Plum, Cherry, and also upon the Oak. Reaumur's description of the larva accords exactly with the slimy grub of the Pear-leaves which is occasionally so injurious in this country, the history of which will be found in the *Gardeners' Chronicle* for 1842, p. 692, where the name of Tenthredo Cerasi is applied to it. As we have this day (20th July) obtained the perfect fly of this species in a living state, from larvæ sent to us last autumn by several of our correspondents (as acknowledged in the answers to inquiries at the time), we are in a situation to decide upon its want of identity with the true Tenthredo Cerasi of Linnæus; our insect (which we here produce,) being black with black legs, except that the four fore tibiæ and tarsi are pitchy-brown; whereas Linnæus says that his T. Cerasi has all its legs pale clay-coloured, and a yellow scutellum, and (what is of more interest) that it rolls up the leaves of the Cherry, in order to undergo its transformations. Now these characters will not agree with the saw-fly produced from the slimy grub of the Pear and Cherry, the latter de-



scending into the earth to undergo its transformations. Linnæus indeed incorrectly referred Reaumur's figure above mentioned to his T. Cerasi, and this has led to part of the confusion which exists in the names of these insects.

The German naturalists (Klug and Hartig) have applied to this species the name of T. æthiops, given by Fabricius to an English insect described from Sir J. Banks' collection, entirely of a black colour except the four anterior tibiæ, which are pale (pallidis). Trusting in the accuracy of these authors, we also gave the name and description of T. æthiops to the fly of the slimy grub of the Pear in an article published in the 13th volume of the "Gardeners' Magazine" (giving the period of the last changes of one of these slimy larvæ found on the Whitethorn from Dahlbom's Clavis); but having now reared the insect from these slimy Pear larvæ, we are convinced that this insect is not the T. æthiops of Fabricius, and that it is the Selandria atra of Stephens.



The determination of this point of nomenclature is necessary, not only on its own account, but also as connected with another insect, which is still more troublesome than the slimy grub of the Pear and Cherry.

During the present and past seasons we have received a great number of inquiries respecting the cause of the blight, as it has been generally termed, to which the leaves of many kinds of garden Roses have been subject, and having investigated its history, we append it to the preceding remarks, as it is caused by the real Tenthredo (or Selandria) æthiops.

It is especially in the month of June, when the Rose trees need all their energy for the development of fine blossoms, that many of the leaves turn pale brown, looking as though they had been scorched. On examining them more closely with a lens, we however find that the upper cuticle of the leaf is entirely or partially eaten away, the lower surface of the leaf being always left entire. We have seen trees in Oxfordshire this season with every leaf thus eaten, and as they suffered in the same manner last year, we apprehend they will be much injured in their growth, independent of the annoyance caused by their blighted appearance, and by the flowers being either worthless or entirely abortive. At this period the real cause of the mischief is overlooked (indeed, we believe no previous author has recorded the history of this obnoxious insect) from its near resemblance in colour to the leaves upon which it feeds. The enemy itself is a cylindrical, pale, yellowish green larva or caterpillar, nearly half an inch long, with a darker line down the middle of the back, an orange-coloured head with a small black spot on each side; the segments following the head having several very minute conical points (two larger than the rest) immediately behind the head, but these are so small that they are only to be seen through a lens. Each of the three segments behind the head is furnished with a pair of short legs, and there are seven pairs of prolegs (the last of which is smaller than the rest,) and another pair at the extremity of the body, making 22 feet in the whole. When these larvæ have changed their skins several times, and arrived at their full size, they descend into the earth, where they form little hollow, oval cells of earth, highly polished on the inside, in which they pass the following winter, and wherein also they change first to pupæ, and then, in the spring to perfect insects belonging to the family of the saw-flies and genus Selandria. They are in this state about one-sixth of an inch long, of a glossy black colour, with the wings stained black; the legs pale buff, with all the thighs black except at the tips, and with the hind tibiæ dusky in the middle. This description agrees with T. æthiops. They lay their eggs upon the Roses, and the larvæ are hatched about the end of May.

We are unable to suggest any plan for the destruction of the fly in the perfect state, but the larvæ may be destroyed by repeatedly syringing the leaves with the mixture described in the following communication upon Rose insects from the *Gardeners' Chronicle* of July 15, p. 472.

Rose Insects.—I have made a discovery during the last week, which must be useful I think to all who grow Roses extensively. I have long kept my Rose trees quite clear of green fly and other spring vermin by using a mixture, the receipt for which was communicated to my employer by Mr. Paul, the well known nurseryman and Rose grower, of Cheshunt. The recipe is this: To 12 gallons of cold water add 1 bushel of soot and about half a peck of unslacked lime; stir and mix. Let the mixture stand for 24 hours. The soot will have come to the surface; skim it off. It may be afterwards used several times. Syringe the Roses from a hand syringe or a garden engine. But although this mixture is perfectly efficient during the spring, yet about this time of the year an enemy appears on whom it has no effect. This is a small white grub with a scaly brown head, the scales of which are of a surprising hardness and strength. It destroys the fleshy part of the leaves, leaving them skeletons of fibres not unlike fine lace. Though curious, these destroyed leaves are in a mass unsightly. I need hardly add that this premature destruction of the leaves seriously injures the health and strength of the plants. I have till very lately been quite unable to get rid of this pest by any other method than the laborious one of picking them off by hand, which in large collections is all but impracticable. The lime and soot mixture, tobacco-water, snuff, sulphur, I have all tried in vain. I find, however, that by adding 1 lb of soft soap to the 12 gallons of lime and soot water this grub is effectually and quickly destroyed. The soft soap should be dissolved in warm water before it is added to the other ingredients: *Wm. Corvell. Haileybury, Hertford.*

From the Albany Cultivator.

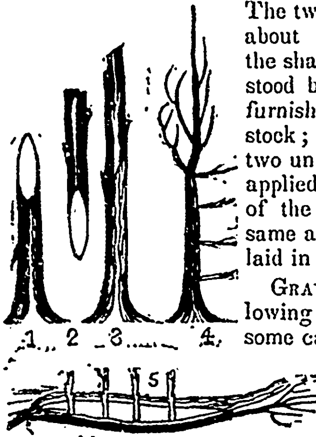
EXPERIMENTS IN GRAFTING.

Several correspondents have favored us with the results of their experiments in grafting, which we believe will be acceptable, in a condensed form, to many of our readers.

E. M. Hoyt, of New-Haven, Vt., gives the following statement of a successful mode of raising a small nursery of apple trees for his own farm:—In the spring of the year, I enrich plentifully with manure a piece of ground near the house, so as to be often under my eye. I then proceed to the orchard or yard where my cattle have been after eating apples in autumn, where I find in their scattered manure apple plants in their second and third leaf. These are removed with the adhering manure and placed in rows. They grow vigorously and require careful weeding, particularly the first season. The second spring many may be grafted, but I usually wait till the third spring, when the plants are two years old.

My grafting process is simple, and if well performed, sure of success.

Being provided with scions, procured in February from trees producing the varieties I desire, also with a quantity of strong brown paper, thinly coated with common grafting wax, the paper being cut into pieces, two by four inches, I cut off the tree obliquely, about 6 inches above the surface of the earth, thus leaving an opportunity in case of failure to regraft below. I then select from the scions, with which I had previously provided myself, one of nearly a corresponding size, and take off about four inches, including at least two buds. This I match on to the stock, so that the bark of the two parts, shall generally come in contact, then holding them firmly pressed together, wind the paper-plaster around the splice with the wax side inward, drawing it very closely. This work should be done on a sunny day, so that the wax will adhere closely, as it is wound twice or thrice around. Rub a little extra wax around the tree, both on the upper and lower edges of the plaster, to exclude rain, &c. This plaster is all the ligature required, as the union soon becomes perfect. After the scion sends forth its shoots, all starting sprouts below the splice, should be removed. As to the precise time for grafting, there seems to be some discrepancy of opinion; but I prefer that time when the buds are swelling. Still, I have met with success when the leaf began to develope itself.



The two parts should lap on each other about an inch and a quarter. That the shape of the splice may be understood by all, the annexed drawing is furnished; fig. 1, representing the stock; fig. 2, the scion; and fig. 3, the two united before the wax plaster is applied; fig. 4 shows the appearance of the stock and graft, and fig. 5 the same after the stock is bent down and laid in the earth.

Grafting into layers.—The following mode, altho' not wholly new, in some cases may be found to possess advantages over other modes, where stocks may be scarce. Take a stock of two or three years old from the seed, split it with a sharp point-ed knife, about once in three or four inches; whittle off your scion wedge-shaped, and stick it at right angles through the stem. Apply wax and bandage, bend down the stock and confine it in a trench three or four inches deep; cover up with earth, leave one bud of the graft above the surface, and it is done. Three years since I first thought of and practised this plan. Nearly all the scions took and grew finely. The spring following, I divided the stock with a sharp knife between each graft and let them stand. This spring I transplanted them, found them perfectly sound where they passed through the stock, and finely rooted. From 100 stocks, you can have from 300 to 400 thrifty grafts—quite a saving of labor and time

A. B. Price, M. D., *Boon Grove, Porter Co., Ia., March 1848.*

TIME FOR PRUNING ORCHARDS.

D. Sinclair, jr., writes from Cape Island as follows:—"My objection to pruning in the winter is, the frosty winds dry and crack the wound; if delayed till May, the sap would keep it alive till grown over. I have for several years pursued the business of grafting in Canada and the States, and have seen trees that were pruned in the winter on the decay, while those of equal size pruned at another season, were healed. I use a moist and durable composition, bearing the changes of the weather, and will cover the wound until grown off. It consists of—

Beeswax, 1 lb.,
Tallow, ¾ lb.,
Rosin, 4½ lb.

Early summer pruning would, doubtless, be advantageous in several respects, but it usually happens that it is a very busy season with nearly all cultivators. There appears, however, to be no objection to late winter pruning, if the wounds are protected by a suitable water-proof covering; a good and cheap one consists of a mixture of tar and brick dust applied warm; or a better and more expensive one may be made by dissolving as much gum shellac in alcohol as will make it of the consistence of paint, to be kept corked in a wide bottle and applied with a brush.—*Albany Cultivator.*

From the Gardeners' Chronicle.

There is an idea on which the whole THEORY of FARMING rests, the truth of which, though as nearly as possible self-evident, has not, we are convinced, that constant residence in the mind of the agricultural student which it deserves. The idea is connected with the atomic theory to which we lately adverted. It might be expressed thus:—Farm products are made of atoms, which though built up together, it may be for the first time in the forms we see, have always, each of them, existed since the creation, possessed of the properties then conferred upon them. This may appear to be a very abstract proposition—one of little practical use—but we believe that no definite idea of the rationale of any farm process is possible without the admission of it.

The indestructibility and unchangeable nature of matter are capital points in the theory of agriculture. Strange as the statement may seem to one who sees the manure added to the soil, and the harvest taken from it, no farm process alters the nature of the matters on which it acts: the living plant or animal cannot change the character of the atoms presented to it; it flourishes or dies according as they are food or poison; it can but select those proper to its growth. Extra fertility is simply an extraordinary accumulation in the soil of those atoms which form the substance of our cultivated plants; skill in agriculture is for the most part simply that which enables the farmer to procure these atoms from the cheapest sources and collect them for use by the living seed or plant he has placed in the soil to assimilate them; the efficiency of all agricultural *practice consists in its ability to detach these atoms from previous* combinations, setting them free for use by the vegetable at the time it requires them.

Now take either an onwards or a retrospective glance at agriculture: consider in the one case how the soil during winter becomes broken up, disintegrated, and decomposed, under the influence of frost and rain, how it is enriched from the farmyard in spring, and how the atoms thus prepared in it and added to it are absorbed along with other atoms from the air, and, uniting, form within and on the plant the produce aimed at by the farmer. Or, on the other hand, take a specimen of farm produce—flesh, for instance; consider whence the atoms which form it have been taken—the various processes, combinations, and decompositions which they have undergone since first taken from the earth or the air. Mark how each has maintained its individuality and its character throughout—the numberless companions from which it has parted—the others with which it has united, until all have become resident in the animal structure of which they ultimately form a part.

Such an examination, if worked out in detail, would convey a perfect idea of the nature of that chemical manufacture which we call farming. And while analysis enables us to conduct it more into detail as regards the general truth on which we have been insisting, so we are able to apply the idea with equal force to every portion of farm practice. That of manuring, for instance: how entirely it destroys the merit of mere bulk or weight, apart from composition! So many "cubic *yards per acre" are often spoken of—but no information* as to the value of the application can thus be conveyed. The question is whether the particles are really there which shall ultimately take their place in the product aimed at. We know of no better subject for investigation in this way than that which the English Agricultural Society has propounded for one of their Essays for 1849:—How to increase the produce of meat? A full discussion of it will involve every agricultural process, from the preparation of the soil to the sale of the ox. The atoms of which meat is formed are no doubt worked apart from the soil by nature: added to it by art; absorbed by plants; taken from the air and the rain; united, and parted, and re-united as the crop matures; and, when harvested and mixed with other matter imported on the farm, prepared for food; and ultimately separated during digestion for the nutrition of the various parts of the animal. At every stage of the lengthened process, economy may be usefully applied or waste suffered, and thus everywhere there is room for the application of skill and intelligence.

The atomic theory, so to speak, of farm practice will lead us, *too, to see how* fertility may be self-sustained: how, in the long run and over the surface of a large territory, it will appear that the actual weight of matter comprised in the animal, or in the vegetable, or in the mineral kingdom, remains constant, so that no transposition of matter from the one to the other is carried on to any great extent—to the enrichment of the one or the impoverishment of the other. The atoms removed from the soil, it will thus appear, should, under good management, all return to it again—and to a great extent they do. This point we propose to illustrate at some length, from an experience extending over a few acres but many years, with the interesting details of which we have been favoured. But we must postpone further remarks to another opportunity.

PROPER STAGE OF CUTTING WHEAT.

From the Albany Cultivator.

The proper time for cutting wheat is a subject which has been considerably discussed, and in regard to which there is probably still some difference of opinion. Many experiments have been made in England, in order to ascertain at what stage the crop would afford the greatest profit. The results all point to an earlier period than has formerly been thought best for this operation. Mr. Colman made very particular inquiries of the best farmers and millers in regard to this point. He states as the result of his inquiries, that "the best rule for harvesting, is not when the stalk below the head has changed colour, and the circulations have consequently ceased, but when the grain, though it has ceased to yield any milk upon pressure, is yet soft." So far as trials have been made in this country, they are not at variance with the above, and some of our wheat raisers have now adopted the rule of beginning to harvest while the grain is *doughy*. The advantages of cutting at this stage have been briefly given as follows:—"Wheat cut early, affords more grain, yields less bran, makes better flour, shells less in harvesting, wastes less in gleaning, gives better straw, and enables the farmer to do the work more leisurely."

It may be interesting to notice with attention some of the experiments which have been made in cutting wheat at different times. In the 12th and 13th volumes of the Scottish Quarterly Journal of Agriculture, Mr. Hannam has given the details of several particular and careful trials made under his own direction. In one instance he cut samples of wheat at five different times, as follows:—

No. 1, was cut a month before fully ripe.
" 2, " three weeks " "
" 3, " two " " "
" 4, " two days " "
" 5, " when fully ripe.

Of these lots, 100 pounds of the grain of each yielded as follows:—

No.	Flour.	Seconds.	Bran.
1	75 lbs.	7 lbs.	17 lbs.
2	76	7	16
3	80	5	13
4	77	7	14
5	72	11	15

Thus it appears that No. 3, which was cut two weeks before it was fully ripe, was superior to the other lots; giving more per bushel than No. 5, (cut when fully ripe) by 6½ pounds of flour, and a gain of about 15 per cent. on the flour of equal measure of grain: 100 pounds of wheat of No. 3, makes 80 pounds of flour, while 100 pounds of No. 5 yields 75; showing an average of 8 per cent. in favor of No. 3. In grinding, it was found that No. 5 ground the worst— worse than No. 1. There were in No. 5 a greater quantity of flinty particles, which would not pass the bolt, than in any of the other lots. The bran from No. 5 was also much thicker and heavier than that of No. 3.

Mr. Hannam concludes, that in cutting wheat two weeks before it is fully ripe, there is a gain of fifteen per cent. of flour upon equal measures, a gain of 14 per cent. in the weight of straw, and a gain of 7s. 6d. sterling in the value of every quarter (560 lbs.) of wheat.

The Use of Peat Charcoal as a Manure.—Mr. P. Mackenzie, of Stirling, has recorded in the *Quarterly Journal of Agriculture*, the following experiment:—"In the spring of last year, I collected a quantity of peat for various purposes, and part of it was intended to be charred or burned. It was not so well prepared for burning as I wished, a good deal of moisture being in it; however, a good fire was made of wood to begin with, and as the peat dried it was drawn to the fire, and in this way was kept burning for two weeks. It required little watching, only once or twice in twelve hours. The partially dried peat was drawn to the fire, because it was intended to have a quantity of *charred* peat and ashes mixed together, and in order to obtain both, the fire was kept in a smothered state to *char* the peat (let the farmer mark the distinction.) It commonly burst through in some parts, and there supplied the ashes. When we had a quantity to begin with, the unburnt peat, and the charred, with the ashes, were all well mixed together; at least one-half of the mass was unburnt peat." This mixture was applied about the beginning of May, to a light sandy soil, for a crop of Swedish turnips. The quantity used was at least at the rate of 200 bushels per acre. "We tried it," continued, Mr. Mackenzie, "against well-made stable-manure in a state like mould, cut well with the spade, which was applied at the rate of about 20 tons to the acre, and spread into drill, like the peaty mixture. The plants grew well in both cases. We tried to ascertain the amount of produce per acre from each manure, as late as the middle of January, 1846; for, from the mildness of the season, the turnips till then appeared to be in a growing state, each plant having had about two square feet of surface to grow upon. The surface was kept flat, and the ground chiefly worked with the Dutch hoe. The weight of bulbs fit for use manured with the peaty mixture was upwards of 40 tons per acre; while those produced from stable-dung weighed only about 30 tons. One row of peas was also manured with the peaty composition, and yielded as great a crop as those manured with the stable-manure.

Animal Manures.—All portions are good, but different in the rapidity of their fertilizing effects, and also in their duration. The principle of this difference is thus described by Professor Johnstone:—"Horn, hair, and wool depend for their efficacy precisely on the same principles as the blood and flesh of animals. They differ chiefly in this, that they are dry, while blood and flesh contain 80 to 90 per cent. of their weight of water. Hence, a ton of horn shavings, of hair, or of dry woollen rags, ought to enrich the soil as much as ten tons of blood. In China, the hair, which every ten days is shaven from the heads of the entire population, is collected and sold for manure throughout the empire. The effect of soft animal matters is more immediate and apparent, while that of hard and dry substances is less visible, but continues for a much longer period of time. Woollen rags, ween made into a compost and fermented, form an excellent manure for potatoes or turnips. In the hop countries, they are buried at the roots of the plants with great advantage. They sell at about £5 per ton."

Newcastle Farmer.

COBOURG, CANADA WEST, OCTOBER 1, 1848.

The approaching Exhibition of the Provincial Association at Cobourg, engages, at this time, all the attention of the Agricultural world of the Newcastle and neighbouring Districts especially, and in a great measure that of the same class of the more remote Districts. It must be remembered that while Agricultural matters stand prominent, they are not the only subjects embraced in the design of the Association, for it will be seen by the Premium list that for the produce of the workshop and the loom, the garden and the foundry, the ladies' parlour and the artists' atelier, awards are offered, to make the Exhibition, by its great variety and multifarious display, generally interesting and worthy the patronage and support of all classes.

We are aware that there will appear, in some instances, a great disparity in the amount of Premiums, compared with the nominal value of some of the articles entered for Exhibition, and this more especially with reference to the Fine Arts, but this, in the present state of the funds of the Society, it was not in the power of the Committee to avoid, but we doubt not, when the true value of the Institution is better known, it will receive a far greater amount of support from the public generally, and thus enable the Directors to offer premiums more commensurate to the productions of the rising talent of the country; at present it is but in its infancy, but we believe, should the Exhibition go off well at Cobourg, and we do not doubt it, it will be the best move the Directors have made in bringing it to this town.

We would earnestly press upon the mechanics of our town, to give it their utmost support, and by a display of their various skill and ability in every description of handicraft, place the good town of Cobourg, in an enviable position among the *cities* of Western Canada.

While on the subject, we would remark that Exhibitors need not fear for the protection of their various articles, since there will not be a repetition of the disasters occasioned at Hamilton by the exceedingly unpropitious weather, by which many of the finer articles were injured past recovery, and a heavy loss sustained by many of the best contributors to the Exhibition. In the present case the buildings will be water tight at least, and every possible care and attention will be given by the Committee, for the full protection of every article on the ground.

THE PROVINCIAL EXHIBITION.

Deeming the Prize List a matter of great public interest, we have delayed the publication of the *Farmer* till we could give it in full. We also give the Resolutions passed at a meeting of Directors, &c.

LIST OF PRIZES

Awarded at the Provincial Exhibition, held at Cobourg, on the 3d, 4th, 5th and 6th October, 1848.

CLASS A.—DURHAMS.

Judges.—Archibald McKellar, Western District; James Covernton, Talbot District; George Buckland, Home District.

Best aged Bull, John Walton, Smith, C. D., £7 10s.
Second ditto James Nightingale, York, H. D., £4.
Third ditto, Jonathan Peel, do. do., £2.
Best two year old Bull, E. W. Thompson, Etobicoke H. D., £5.
Second ditto, James Gillard, Haldimand, N.D., £3.
Third ditto, Ralph Wade, Sen. Hamilton, N. D., £1 10s.
Best one year old Bull, Matthew Joness, Darlington, N.D.,£4.
Second ditto, Nathaniel Davis, York, H. D., £2.
Third ditto, George Roddick, Hamilton, N. D., £1.
Best Bull Calf, Alexander McNaughton, Nassagaweya, G. D., £2.
Second ditto, John Wetenhall, Nelson, G. D., £1.
Third ditto Nathaniel Davis, York, H. D., 10s.
Best Cow, Ralph Wade, Jr., Hamilton, N. D., £4.
Second ditto, John Wade, Hamilton, N. D , £2 10s.
Third ditto, Ralph Wade, Sen., Hamilton, N. D., £1 10s.
Best two year old Heifer, Ralph Wade, Jr., Hamilton, N.D., £3.
Second ditto, John Wetenhall, Nelson, G. D., £2.
Third ditto, Thomas Mairs, Vespry, S. D., £1.
Best one year old Heifer, Ralph Wade, Sen., Hamilton, N. D., £2.
Best Heifer Calf, E. W. Thompson, Etobicoke, H. D., £1 10s.
Second ditto, Robert Wade, Hamilton, N. D., 15s.

CLASS B —DEVONS.

Judges.—Same as Class A.

Best aged Bull, Richard Gapper, Toronto, H. D., £7 10.
Best one year old Bull, A. A. Burnham, Cobourg, N. D., £4.
Best Cow, Richard Gapper, Toronto, H. D., £4.
Second ditto, John Mason, Cobourg, N. D., £2 10s.
Third ditto, Asa A. Burnham, do. do. £1 10s.

CLASS C.—HEREFORDS.

Judges.—Alex'r Mellis, Newcastle District; John Scott, Home District; Mr. Drury, Simcoe District.

None on the Ground.

CLASS D.—GRADE CATTLE.

Judges.—Same as Class C.

Best Cow, John Flannagan, Kingston, M. D , £4.
Second ditto, Thos. Davis, York, H. D., £2 10s.
Third ditto, John Belwood, Sen., Clarke, N. D , £1 10
Best 2 year old Heifer, John Cade, Oshawa, H. D., £3.
Second ditto, John Walton, Smith, C. D., £2.
Third ditto, John Cade, Oshawa, H. D., £1
Best 1 year old Heifer, Thos. Davis, York, H. D., £2.
Second ditto, Ralph Wade, Hamilton, N. D., £1.
Third ditto, Jno. Wade, Hamilton. do. 10s.
Best Heifer Calf, J. O. Butler, Haldimand, do., £1 10s.
Second ditto, John Mason, Cobourg, do., 15s.
Third ditto, Jno. Wade, Hamilton, do., 10s.

FAT CATTLE.

Best Ox or Steer, C. Hinds, Haldimand, do., £2 10s.
Second ditto, Jas. Mann, Cobourg, do., £1 5s.
Best Cow or Heifer, John Wade, Hamilton, do., £2 10s.
Second ditto, C. Hinds, Haldimand, do., £1 5s.
Best Yoke of Working Oxen, Thos. Simpson, Cramahe, do., £3.
Second ditto, Christopher Hinds, Haldimand, do., £2.
Third ditto, Wm. Alger, Colborne, do., £1.

CLASS E.—HORSES.

Judges.—Richard Dennison, Home District; Ivia C. Winans, Rochester, N. Y.: Thomas M. Taylor, Western District.

Best Stallion for Ag. purposes, Jos. Ashford, York, H. D. £10.
Second ditto, Nathaniel Davis, York, do., £6 5s.
Third ditto, Elijah Wallbridge, Clarke, N. D., £2 10s.
Best 3 year old Stallion, R. C. Smith. Chinguacousy, H. D., £5.
Second ditto, Jos. Ashford, York, do., £3.
Third ditto, Angus Crawford, Cobourg, N. D., 1*l*.
Best 2 year old Gelding or Filly, John Wilson, Oshawa, H. D., 3*l*.
Second ditto, Geo. Graham, 2*l*.
Third ditto, James Lowes, Hope, N. D., 1*l*.
Best span Matched Carriage Horses, Wm. Weller, Cobourg, do., 4*l*.
Second ditto, ditto, ditto, 3*l*.
Third ditto, J. B. Fortune, Cobourg, do., 1*l*.
Best span of Draught Horses, Robt. Beith, Darlington, do., 4*l*.
Second do., C. Bowman, Bowmanville, do., £3.
Third ditto, A. Secor, Darlington, do., £1.
Best Mare and Foal, Daniel Arnott, Clarke, do., £5.
Second ditto, John Short, Clarke, do., £3.
Third ditto, James Taylor, York, H. D., £1.
Best thorough-bred Stallion, Geo. Cooper, York, H. D., £5.
Second ditto, D. E. Boulton, Cobourg, N. D., £3,
Third ditto, Sidney McDonald, Colborne, do., £1.

CLASS F.—SHEEP.

Judges.—William Beatty, Home District; Samuel Dickson, Newcastle District: Peter Dowey, Midland District.

LEICESTERS.

Best aged Ram, Wm. Miller, Pickering, H. D., £4.
Second ditto, ditto, ditto, £2.
Third ditto, Ralph Wade, Jr., Hamilton, N. D., £1.
Best Shearling Ram, Jas. Dixon, Clarke, do., £2 10s.
Second ditto, Wm. Miller, Pickering, H. D., £1 10s.
Third ditto, M. D. Crusoe, Hamilton, N. D., 15s.
Best Ram Lamb, Ralph Wade, Jr., ditto, ditto, £2.
Second ditto, Geo. Miller, Markham, H. D., £1.
Third ditto, James Taylor, York, do., 10s.
Best three aged Ewes, Wm. Miller, Pickering, H. D., £3.
Second ditto, ditto, ditto, £2.
Third ditto, James Taylor, York, do. £1.
Best three Shearling Ewes, Jas. Taylor, do., £3.
Second ditto, Wm. Miller, Pickering, do., £2.
Third ditto, John Joplin, Hamilton, N. D., £1.
Best three Ewe Lambs, James Taylor, York, H. D., £1 10s.
Second ditto, Geo. Miller, Markham, do., £1.
Third ditto, Matthew Joness, Darlington, N. D., 10s.

SOUTH DOWNS.

Best aged Ram, John Wetenhall, Nelson, G. D., £4.
Second ditto, A. A. Burnham, Cobourg, N. D., £2.
Third ditto, John Smart, Darlington, do., £1.
Best Shearling Ram, John Wetenhall, Nelson, G. D., £2 10s.
Best Ram Lamb. A. A. Burnham, Cobourg, N. D., £2.
Second ditto, John Wetenhall, Nelson, G. D., £1.
Third ditto, A. A. Burnham, Cobourg, N. D., 10s.
Best three aged Ewes, A. A. Burnham, do., £3.
Second ditto, John Wetenhall, Nelson, G. D., £2.
Third ditto, ditto, ditto, £1.
Best three Ewe Lambs, ditto, ditto, ditto, £1 10s.
Second ditto, ditto, ditto, 1*l*.
Third ditto, ditto, ditto, 10s.

MERINOS OR SAXONS.

Judges.—G. S. Borrill, Newcastle District: Alexander Pamely, Newcastle District; J. W. Rose, Eastern District.

Best aged Ram, Capt. Colleton, Haldimand, N. D., 4*l*.
Second ditto, Henry Covert, Cobourg, do., 2*l*.
Third ditto, Henry Thompson, Hope, do., 1*l*.
Best Shearling Ram, ditto, ditto, 2*l*. 10s.
Second ditto, Thomas Walker, Cramahe, do., 1*l*. 10s.
Best three aged Ewes, Henry Covert, Cobourg, do., 3*l*.
Second ditto, ditto, ditto, 2*l*.
Third ditto, Capt. Colleton, Haldimand, do. 1*l*.
Best fat Wethers, Wm. Miller, Pickering, H. D , 2*l*. 10s.
Second ditto, John Cade, Oshawa, do., 1*l*. 10s.
Third ditto, Ralph Wade, Jr., Hamilton, N. D., 15s

Best twelve table Carrots, James Fleming, Toronto, 10s.
Second ditto, ditto, Walton Beck, Cobourg, N. D., 5s.
Best Twelve roots white Celery,|G. S. Daintry, Cobourg, N, D., 10s.
Second ditto, ditto, G. M. Manners, ditto, ditto, 5s.
Best six Egg Plants, William Geary, Cobourg, N. D., 10s.
Best peck blood Beets, Mr. Whitehead, Port Hope, 10s.
Second ditto, ditto, J. H. Wiese Ameliasburg P. E. D. 5s.
Best peck White Onions, Paul Clapp, Hillier, P. E. D. 10s.
Second ditto, ditto, James Fleming, Toronto H. D. 5s.
Best peck yellow Onions, ditto, ditto, ditto, 10s.
Second ditto, ditto, James Geary, Cobourg, N. D., 5s.
Best peck red Onions, Thomas Donally, Bloomfield, P. E. D., 10s.
Second ditto, Henry Turner, Toronto, 5s.
Best twelve roots Salsify, Alex. Shaw, Toronto, 10s.
Second ditto, James Fleming, Toronto, 5s.
Best peck White Turnips, John Barnard, South Monagan, N. D., 10s.
Second ditto, Henry Hart, do, 5s.
Best peck White Beans, William Geary, Cobourg, 10s.
Second ditto, Thomas Scott, do, 5s.
Best Greenhouse Plants, William Geary, do, £1.
Second ditto, William Jeckell, do, 10s.

CLASS N.—SEEDS AND ROOTS.

Judges.—D. C. Boyce, Johnstown District: Joseph Phillips, Newcastle District; John Gilbert, Victoria District.

The Canada Company's Prize, Best 25 bush. Fall Wheat, Clarkson Freeman, Flamboro' West, Gore D, £25.
Best 2 bus. Winter Wheat, Clarkson Freeman, Flamboro' West, G. D., £2.
Second ditto, James Lafferty, £1 5s.
Third ditto, Thomas Vickers, Clark N. D. 15s
Best Spring Wheat, William Brock, ditto, ditto, £2.
Second ditto, William Lane, Cramahe, ditto, 1l5s.
Third ditto, James Fife, Asphodel, Colborne D. 15s.
Best Barley, Alex. Shaw, Toronto, 15s.
Second ditto, Clarkson Freeman, Flamboro' West, Gore D., 10s.
Third ditto, John Pearce, Clark, N. D., 5s.
Best Oats, John Ritson, Oshawa, H. D, 10s.
Second ditto, Capt. Colleton, Haldimand, N. D. 5s.
Best Peas, Joseph Hagerman, Hamilton ditto, 10s.
Second ditto, William Roddick, ditto, ditto, 5s.
Best Indian Corn, William Lane, Cramahe, ditto, 10s.
Second ditto, Ephraim Powell, Hamilton, ditto 5s.
Best Timothy Seed, Josias Gillard, Haldimand, ditto, 10s.
Second ditto, Alex. Shaw. Toronto, 5s.
Best bushel Clover Seed, ditto, ditto, 10s.
Second ditto, John Wade, Hamilton, N. D. 5s.
Best bushel Flax Seed, William Allan Hope, ditto, 10s.
Second ditto, Robert McNeir, Vaughan, H. D. 5s.
Best bushel Hemp Seed, James Fewester, Oshawa, H.D. 10s.
2nd ditto, ditto, ditto, 5s.
Best 20 lbs. Swede Turnip Seed, Wm. Jeckell, Hamilton, N. D., 10s.
2nd ditto, Richard Allen, Darlington, ditto, 5s.
Best bag of Hops, Jas. Nightingale, York, H. D., £2 10s.
2nd ditto, Dunning & Green, Sophiasburg, P.E.D., £1 10s.
Best two bushels Potatoes, R. Allen, Darlington, N.D. 10s.
2nd ditto, James Thomas. Haldimand, ditto, 5s.
Best two bushels Swede Turnips, William Brown, Jun., Hamilton, N. D., 10s.
2nd ditto, John Wade, ditto, ditto, 5s.
Best bushel Carrots. George Roddick, ditto, ditto, 10s.
2nd ditto, William Roddick, ditto, ditto, 5s.
Best bushel Mangold Wurtzel, Josias Gillard, Haldimand, N. D. 10s.
Best Sugar Beets, J. Joplin, Hamilton, N. D., 10s.
Best bushel Parsnips, Mrs. Grover, Colborne, ditto, 10s.

CLASS O.—IRON AND HOLLOW WARE.

Judges.—John Helm, senior, Cobourg: John Helm, junior, Cobourg; John Thomas, Colborne.

Best Cooking Store with Furniture, R. P. Colton, Brockville, J. D., £1 10s.
Second ditto, ditto, ditto, £1.
Third ditto, ditto, ditto, 10s.
Best Parlor Store, ditto, ditto, £1.
Second ditto, ditto, ditto, 10s.
Best balance Scales, M Purser, Cobourg, N. D. £1.
Best model Hot Air apparatus, G. S. Browse, 1l. 10s.
Best six Corn Brooms, Joseph Mills, Hallowell, P. E. D., 7s. 6d.
Second ditto, John Mills, ditto, 5s.
Best Wooden Pail, B. Carruthers, St. Catherines, G. D., 7s. 6d.
Second ditto, ditto, ditto, 5s.
Best pair of Hames, Male & Toogood, Haldimand, N. D., 10s.
Second ditto, Skinner & Co., Brockville, J. D., 5s.
Best Saddle Tree, ditto, ditto, 10s.
Best Board Rule, F. S. Clench, Cobourg, N. D, 10s.
Second ditto, ditto, ditto, 5s.
Best six Axe Handles, Thomas Richards, Hamilton, N. D., 7s. 6d.
Second ditto, Jas. H. Wiese, Ameliasburg, P. E. D., 5s.
Best Churn, D. C. Warren, Toronto, H. D., 10s.
Best Fowling piece, W. Tobin, Cobourg, N. D., 15s.
Second ditto, ditto, ditto, 10s.
Best Rifle, John Wright, Colborne, N. D., 15s.
Second ditto, Mr. Whitehead, Port Hope, N. D., 10s.

CLASS P.—LADIES' DEPARTMENT.

Judges.—Miss Reiley, Cobourg; Mrs. Boulton, Cobourg; Mrs. G. M. Boswell, Cobourg.

Best pair Woollen Socks, Oren Strong, Hamilton, N. D., 10s.
Second ditto, Miss Stewart, Haldimand, N. D., 5s.
Best pair Woollen Stockings, Mrs. Little, Hamilton, N. D., 10s.
Best pair Woollen Mittens, Miss J. Robson, Clarke, N. D. 10s.
Second ditto, Miss E. Rennock; ditto, ditto, 5s.
Best pair Woollen Gloves, Miss R. A. Page, Cobourg, N. D., 10s.
Second ditto, Miss E. Rennock, Clark, N. D., 5s.
Best Straw Hat, Miss Webster, Hamilton, N. D., 10s.
Second ditto, Ann Stewart, Haldimand, N. D., 5s.
Best specimen of Woollen or Cotton Netting, Mrs. Armour, Cavan, N. D., 15s.
Second ditto, Miss J. Robson, Clark, N. D., 5s.
Best specimen Fancy Netting, Miss McGran, Cobourg, N. D., 15s.
Second ditto, Miss Stewart, Darlington, N. D., 5s.
Best specimen Embroidery, Mrs. Cameron, Cobourg, N. D., 15s.
Second ditto, Miss C., ditto, ditto, 5s.
Best specimen Raised Worsted Work, Miss E. Clench, Cobourg, N. D., 15s.
Second ditto, Miss J. Robson, Clark, N. D., 5s.
Best specimen Wax Flowers, Miss Clench, Cobourg, N. D., 15s.

CLASS Q.—FINE ARTS.

Judges.—W. M. Wilson, Simcoe, Talbot District: G. A. Barber, Toronto, Home District; R. N. Watts, M. P. P., L. C.

Best specimen Oil Painting, Peter March, Toronto, H. D., 2l. 10s.
Second ditto, ditto, ditto, 1l. 10s.
Best specimen Figure Painting, E. C. Bull, York, H. D., 2l. 10.
Second ditto, Miss Clench, Cobourg, N. D., 1l. 10s.
Best specimen Landscape Painting, ditto, ditto, 2l. 10.
Second ditto, ditto, ditto, 1l. 10s.
Best specimen Portrait Water Colors, Hoppner Meyer, Toronto, H. D., 2l.
Second ditto, Mrs. McDonald, Cobourg, N. D., 1l. 5s.
Best Figure Water Colors. Miss Clench, do., 2l.
Second ditto, G. D. Wells, Toronto, 1l. 5s.
Best specimen Landscape Water Colors, E.C. Bull, York, H. D., 2l.
Second ditto, ditto, ditto, 1l. 5s.
Best specimen Crayon Portrait Drawing, S. Fleming, 2l. 10s.
Best ditto, Figure Drawing, Mrs. Wetenhall, Nelson, G. D., 2l.
Second ditto, Miss Thompson, Etobicoke, H. D., 1l. 5s.
Best specimen Pencil Portrait Drawing, Hoppner Meyer, Toronto, 2l.
Best specimen Pencil Figure Drawing, E. C. Bull, Toronto, 2l.
Best ditto, Landscape ditto, Miss Ryley, Hamilton, N.D., 1l. 5s.
Second ditto, Miss Thompson, Etobicoke, H. D., 1l. 5s.
Best specimen Lithography, Scobie & Balfour, Toronto, 2l.
Second ditto, ditto, ditto, 1l. 5s.
Best specimen Wood Engraving, Lowe, Toronto, 2l.
Best Copper ditto, Hoppner Meyer, Toronto, 2l.
Best ditto, Steel ditto, Hoppner Meyer, ditto, 2l. 10s.
Best case Stuffed Birds, Jos. Bertram, Cobourg, 1l.
Second ditto, ditto, ditto, 10s.
Best Picture Frame, F. S. Clench, Cobourg, 1l.
Second ditto, — Wereham, Toronto, 10s.
Best specimen Glass Staining, E. C. Bull, Toronto, 1l.

CLASS R.—POTTERY.

Judges.—Same as class O.

Best specimen Pottery, (any article) John Browascombe, Hope, N. D., 15s.
Second ditto, James Bellie, Bowmanville, N. D., 10s.
Third ditto, ditto, 5s.
Best Draining Pipe, A. A. Adams, Montreal, L. C., 15s.
Second ditto. Jas. Bellie, Bowmanville, N. D., 10s.
Best Dozen Bricks, A. A. Adams, Montreal, L. C., 15s.
Second ditto, ditto, ditto, 10s.
Third ditto. Malcolm McNeil, Hamilton, N. D., 5s.

CLASS S.—BOOK BINDING, PAPER, &c.

Judges.—John Robson, Newcastle District; S. Skinner, Toronto; Richard Chatterton, Cobourg; Major T. G. Anderson, Cobourg.

Best sp,n Book Binding, Goodeve & Corrigal, Cobourg, 1l.
Second ditto, Scobie & Balfour, Toronto, 15s.
Third ditto, Goodeve & Corrigal, Cobourg, 10s.
Best sp'n Letter Press Printing, Scobie & Balfour, Toronto, 1l.
Second ditto, H. J. Ruttan, Cobourg, 15s.

CLASS T.—INDIAN PRIZES.

Judges.—Same as class S.

Best Bark Canoe, Joshua Paul, Hamilton, 1l. 10s.
Best 4 Paddles, Joshua Paul, ditto, 10s.
Second ditto, Polly Sopper, ditto, 5s.
Best Indian Cradle, Margaret Anderson, Rice Lake, 15s.
Second ditto, Hannah Smith, ditto, 10s.
Best Tobacco Pouch, Hannah David, Rice Lake, 5s.
Second ditto. Sarah Potash, 3s.
Best Pipe of Peace, Smith Tobercore, 15s.
Best Pipe of War, John Rice Lake, 15s.
Best pair Moccasins (worked with Porcupine Quills) Joshua Paul, 7s.
Second ditto, Mary Cabbage, 5s.
Best Fruit Basket, Sarah Charcoal, 7s
Second ditto, ditto, ditto, 5s.

CLASS G.—PIGS.

Judges.—B. Wells, New York; G. D. Wells, Home District; G. Filliter, Victoria District.

Best Boar, Richard Pascow, Clarke, N. D., 3*l*.
Second ditto, John Wade, Hamilton, do., 2*l*.
Third ditto, Wm. Weller, Cobourg, do., 1*l*.
Best Breeding Sow, Matthew Joness, Darlington, do., 3*l*.
Second ditto, Ralph Wade, Senr., Hamilton, do., 2*l*.
Third ditto, Ralph Wade, Jr., do., do., 1*l*.

CLASS H.—AGRICULTURAL IMPLEMENTS.

Judges.—John Watson, Home District; James Duncan, Bathurst District; T. D. Farley, Victoria District.

Best Wooden Scotch Plough, John Bell, Toronto, H. D. £2.
Second do. Edward McTavish, Darlington, N. D. £1 10s,
Third ditto, ditto, ditto, £1.
Best Iron Scotch Plough, Jno. Gelroy, Scarboro' H. D., £2.
Second do. John Newton, Cobourg, N. D. £1 10s.
Best Canadian Plough, George Hamilton Cobourg, do. £2.
Second do. James Harvey, Smith, C. D. £1 10s.
Third ditto, ditto, ditto, £1
Best Subsoil Plough, John Ritson, Oshawa. H. D., £2.
Best Pair of Harrows, John Kells, Cavan, N. D., £1.
Best Fanning Mill, Lawson Butterfield, Oshawa, H. D. £1 10s.
Best Horse Power Thresher & Separator, John Mason, Cobourg, N. D., £5.
Best Straw Cutter, Richard Tremain, Clark, N. D. £1.
Second ditto, John Bell, Toronto, H. D. 15s.
Best Smut Machine, Duncan & Co., Cobourg, N. D. £1 10s.
Second ditto, ditto, ditto, 15s.
Best Corn and Cob Crusher, Helm & Son, Cobourg, £1.
Best Two Horse Waggon, Thomas Brown, Darlington, ditto, £2.
Second ditto, Henry Cunningham, Ameliasburgh P. E. D., £1.
Best Horse Rake, Lewis Card, 15s.
Best Reaping Machine, Helm & Son, Cobourg, N. D., £5.
Second ditto, John Bell, Toronto. H. D. £3.
Third ditto. John Helm & Son, Cobourg, N. D. £2.
Best Farm Gate, J. P. Cummings, Cobourg, ditto, 15s
Best Brick making Machine, A. Adams, Montreal. L. C. £2 10s.
Second ditto, ditto ditto, £1 10s.

CLASS I.—DOMESTIC MANUFACTURES.

Judges.—Paul Clapp, Prince Edward District; Thomas Briggs, Midland District; Jas. Rogers, Newcastle District.

Best set Horse Shoes, Thos. Spry, Port Hope, N. D., 15s.
Second ditto, Mathew Purser, Cobourg, N. D., 10s.
Third ditto, John Newton, ditto, 5s.
Best half dozen narrow Axes, Chas. Vail, Toronto, H.D., 15s.
Second ditto, Wm. Boyer, Galt, G. D., 10s.
Best half dozen Hay Forks, Joseph McTrickey, Clarke, N.D., 15s.
Second ditto, ditto, 10s.
Third ditto, Skinner & Co., Brockville, J. D., 5s.
Best Scythe Snaiths, ditto, ditto, 15s.
Best Grain Cradle, ditto, ditto, 10s.
Best Grain Shovel, ditto, ditto, 15s.
Best One Horse Pleasure Carriage, A. E. Munson, Cobourg, N. D., £2.
Best Two Horse Pleasure Carriage, Samuel Stevens, Belleville, V. D., £1.
Best set of Farm Harness, Wm. Pearson, Cobourg, N.D., £1 10s.
Second ditto, John Bucham, Clarke, N. D., £1
Best Pleasure Harness, Wm. Pearson, Cobourg, N. D., £1 10s.
Second ditto, J. Bucham, Clarke, N. D., £1.
Third ditto, Geo. Loyness, Belleville, V. D., 10s.
Best Travelling Trunk, Wm. Pearson, Cobourg, N. D., £1 10s.
Best side sole Leather, G. Gifford, Darlington, N. D., 15s.
Second ditto, McDonald & Jamieson, Baltimore, N. D., 10s.
Third ditto, G. Gifford, Darlington, N. D., 5s.
Best side Upper Leather, G. Gifford, ditto, 15s.
Second ditto, McDonald & Jamieson, Baltimore, N. D., 10s.
Third ditto, G. Gifford, Darlington, N. D., 5s.
Best Calf Skin, McDonald & Jamieson, Baltimore, N. D., 15s.
Second ditto, ditto, ditto, 10s.
Third ditto, ditto, ditto, 5s.
Best side of Skirting Leather, Jno. Holmes, Chinguacousy, H. D., 15s.
Second ditto, ditto ditto, 10s.
Third ditto, ditto, ditto, 5s.
Best side Harness Leather, McDonald & Jamieson, Baltimore, N. D., 15s.
Second ditto, ditto, ditto, 10s.
Third ditto, ditto, ditto, 5s.
Best Fur Sleigh Robe, Theron Dickey, Clark, N.D., 15s.
Best specimen Shoemakers' Tools, Kennedy & Brown, Cobourg, N. D. 15s.
Second ditto, ditto, ditto, 10s.
Third ditto, Thomas Judge, Cobourg, N. D., 5s,

CLASS J.—WOOLLEN AND FLAX GOODS

Judges.—John Simpson, Newcastle District; John A. Gimmell, Bathurst District; Jas. Dougall, Prince Edward District.

Best twelve yards Woollen Carpet, Pewst & McIntosh, York, H. D., £1.
Second ditto, ditto, ditto, 10s.
Third ditto, William Gamble, Etobicoke, H. D, 5s.
Bestpair of Woollen Blankets, S. E. McKechnie, Cobourg, N.D., 1*l*
Second ditto, William Gamble, Etobicoke, H. D., 10s.
Third ditto, ditto, ditto, 5s.
Best twelve yards Flannel, S. E. McKechnie, Cobourg, N. D., 15s.
Second ditto, ditto, ditto, 10s.
Third ditto, ditto, ditto, 5s.
Best twelve yards Satinett, ditto, ditto, 15s.
Second ditto, ditto, ditto, 10s.
Third ditto, ditto, ditto, 5s.
Best Broad Cloth from Canadian Wool, ditto, ditto, £2.
Second ditto, ditto, ditto, £1.
Third ditto, ditto, ditto, 10s.
Best twelve yards Winter Tweed, ditto, ditto, 15s.
Second ditto, ditto, ditto, 10s.
Best 10 yards Fulled Cloth, not Factory make, none worthy the first prize.
Second ditto, A. H. Bradley, Haldimand, N. D., 10s.
Third ditto, Robert Garbutt, Cramahe, N. D., 5s.
Best 10 yards Flannel, not Factory make, Joseph Lovekin, Clark, N. D., 15s.
Second ditto, Capt. Colleton, Haldimand, N. D., 10s.
Third ditto, John Gilbart, Belleville, V. D., 5s.
Best piece of Linen Goods, Robert Beith, Darlington, N. D., 15s.
Second ditto, ditto, ditto, 10s.
Best three samples of Flax and Hemp cordage, James Fewester, Oshawa, H. D, 15s.
Best forty pounds of Flax, Peter Davey, Ernestown, M. D. 15s.
Second ditto, James Fewester, Oshawa, H. D., 10s.

CLASS K.—DAIRY PRODUCTS & SUGAR.

Judges,—Joseph Alleyn, Rochester, N. Y.; Allan Wilmot, Newcastle District; James Lovekin, Newcastle District;
E. F. Smith, Rochester, N. Y.

Best 20 pounds Canadian Cheese made in 1848, John Joplin, Hamilton, N. D., £1 10s.
Second ditto, Robert Beith, Darlington, N. D., £1,
Third ditto, T. B. Farley, Belleville, V. D., 10s.
Best Canadian Cheese as Stilton, Ralph Wade, Jr., Hamilton, N. D., £1 10s.
Second ditto, ditto, ditto, £1.
Third ditto, ditto, ditto, 10s.
Best 20lbs. Butter, Robert Clapperton, Baltimore, N. D., £1 10s.
Second ditto, William Eagleson, Hamilton, do., £1.
Third ditto, William Wood, Hope, do., 10s.
Best 20lbs. Maple Sugar, Robert Dunwoodie, Seymour, do. 15s.
Second ditto, Ralph Wade, Jr. do., 10s.
Third ditto, B. Mitchell, Darlington, do., 5s.
Best Sugar made by Indians, Margaret Anderson, Rice Lake, C. D., 10s.
Second ditto, Polly Jackson, Alnwick, N. D., 10s.

CLASS L.—CABINET WARE.

Judges.--John Smart, Newcastle District; William Brock, Newcastle District; N. Choate, Newcastle District.

Best Centre Table, Chartrain & Huff, Cobourg, do., £1.
Best Dining Table, F. S. Clench, Cobourg, do., 1*l*.
Best easy Chair, George Stephens, ditto, ditto, 15s.
Second ditto, ditto, ditto, 10s.
Best six Dining Room Chairs, ditto, ditto, 15s.
Second ditto, Chartrain & Huff, ditto, ditto, 10s.
Best six Drawing Room Chairs, F. S. Clench, ditto 15s.
Second ditto, Chartrain & Huff, ditto, ditto, 10s.
Best Ottoman, George Stephens, ditto, ditto, 15s.
Best work Box, Hugh Hastings, ditto, ditto, 10s.
Best Writing Desk, ditto, ditto, 10s.

CLASS M.—HORTICULTURAL PRODUCTS.

Judges.—Mr. Rapalji N. Y.; Thomas Evans, Cobourg; George Leslie, Toronto; Patrick Barrie, Rochester, N. Y.

Best and greatest number of choice variety of Apples, W. Jeckell, Hamilton, N. D. 15s.
Second ditto ditto, John Thomas, Colborne, N. D. 10s.
Third ditto ditto, Joseph Ross, York, H. D., 5s.
Best twelve table Apples, John Creighton, Hamilton, N. D., 10s.
Second ditto ditto, W. Jeckell, ditto ditto, 7s. 6d.
Third ditto ditto, Thomas Webb, Cramahe, N. D., 5s.
Best twelve winter Apples, James Lovekin, Clark, N. D. 10s.
Second ditto ditto, Theron Dickey, ditto ditto 7s 6d.
Third ditto ditto, John Creighton, Hamilton, N. D., 5s.
Best and greatest variety of Peas, William Jeckell, ditto, ditto, 15s.
Best 12 Table Pears, J. Robson, Clarke, ditto, 10s.
Second ditto, Daniel McKyes, Hamilton, ditto, 7s. 6d.
Third ditto, S. Wilmot, Clarke, ditto, 5s.
Best twelve winter Pears, Edward Baldwin, 10s.
Second ditto ditto, W. Jeckell, Hamilton, N. D., 7s 6d.
Best assortment of Culinary Vegetables Henry Turner, Toronto, 15s.
Second ditto ditto, James Fleming, ditto, 10s.
Second best and greatest variety of Vegetable Roots, James Fleming, ditto, 10s.
Best six heads Broccoli, Henry Turner, Toronto, 10s,
Second ditto, ditto, ditto, 5s.
Best six heads Cauliflower ditto, ditto, ditto, 10s.
Second ditto, ditto, ditto, 5s.
Best twelve Drumhead Cabbages, W. Jeckell, Hamilton, N. D., 10s.
Second ditto, ditto, J. M. Grover, Colborne, N. D., 5s.

Best Clothes Basket, Sarah Potash, 7s.
Second ditto, ditto, ditto, 5s.
Best Hand Basket, Polly Sopper, 7s.
Second ditto, Sarah Potash, 3s.

CLASS U.—PLOUGHING MATCH.

Judges.—A. Alcorn, Newcastle District, W. G. Edmundson, Home District; John Wade, Newcastle District.

OVER 18 YEARS.

1st Mathew McDermot, Clarke, N. D. £4.
2nd Donald McEchery, Hamilton, N. D., £3.
3rd Lawrence Loughton, do., £2.
4th Matthew Watts, Whitby, H. D., £ 1.

UNDER 18 YEARS.

1st Robert Brown, Hamilton, N. D., £4.
2nd Joseph Reedman, Cavan, N. D., £3.
3rd James Rose, £2.
4th Robert Johnston, Hamilton, N. D., £1.

ADDITIONAL PREMIUMS AWARDED BY THE JUDGES, AND GRANTED BY THE EXECUTIVE COMMITTEE.

Ayrshire Bulls, Bathurst District, Diploma.
Leather, Mr. Bell, Carlton Place, ditto.
Turnip Cutter, R. Tremain, Clark, N. D., ditto.
Hats & Caps, A. Secor, Cobourg, ditto, 1st, 2nd and 3rd prizes, 15s., 10s. and 5s.
Boot & Shoe Lasts, Lionel Foster, Salt, Diploma.
Lard Oil, Soap, &c., Sidney Smith, Salt, Diploma.
Horse Blankets, Wm. Gamble, Etobicoke, Diploma.
Summer Tweeds, S. E. MacKechnie, Cobourg, Diploma.
Butter, Ralph Wade, Senior, Hamilton, N. D. would have received 1st. Premium if properly packed, Diploma.
Gloucester Cheese, R. Wade, Jr.; Hamilton, N. D., Diploma.
Stilton Cheese, Mr. Parsons, Ancaster 1st. prize.
Side Board, G. H. Russell, Cobourg, Extra Diploma.
Seed Drill, F. Burnett, Cobourg, 20s.
Grapes, John Gray, Toronto, 25s. 10s.
Hot Air, only one exhibited, Geo. S. Prowse, Prescott.
Model Paddle Wheel, R. D. Chatterton, Cobourg, very highly recommended, Diploma.
Italian Iron, Saml. Hulburt, Prescott, Diploma.
Upright Drill, S. E. Mackechnie, Cobourg, Diploma.
Woollen Reel, Theron Dickey, Clarke, Diploma.
Stove Pipe folder, Diploma.
Machine for trying draught of Ploughs, Saml. Hulburt, Prescott, Diploma.
2 Fire Engines, Henry Spencer, Whitby, Diploma.
Mittens, Mrs. Ruth Bradley, Haldimand, N. D., 5s.
Plaid Shawls, Mrs. McDougall, Picton, P. E. D., Diploma.
2 Quilts, Mrs. Hart Massey, Haldimand, N. D., 10s., 5s.
Vest, Miss C., 5s.
Silver Plate, very highly recommended, Mr Rummage, Kingston, Diploma.
Book-binding Extra, Messrs. Goodeve & Corrigal, Cobourg, Diploma.
Sofa, 1st. prize. Chartrain & Huff, Cobourg.
Second, ditto, G. H. Russell, ditto.
Third, ditto, George Stephens, ditto.
Waggon Boxing Machine, Mr. Burnett, Cobourg, Diploma.
Ox Yoke, F. Forbes, Alnwick, N. D., 5s.
Fire Engine Pump, Geo. Lundy, Rochester, N. Y., Diploma.

ADDITIONAL INDIAN PRIZES.

Canoes, Jno. Beaver, 15s.
Ditto, Jno. Hinds, 10s.
Ditto, Jno. Rice Lake, 10s.
Door Mats, Sarah Potash, 5s.
Ditto, Sarah Charcoal, 5s.
Paddle, Margaret Anderson, 5s.
War Club, Sylvester Smoke, 5s.
Hand Basket, M. Anderson, 5s.
Cradle, Hannah Smith, 5s.
Ditto, Polly Soper, 5s.
Split Basket, Sarah Potash, 5s.
Ditto, Polly Jackson, 5s.
Window Sash, Jno. Rice Lake, 5s.

RESOLUTIONS PASSED AT THE ANNUAL MEETING OF THE PROVINCIAL AGRICULTURAL ASSOCIATION, OCT. 6, 1848.

Moved by E. W. Thomson, Esq., seconded by Mr. Sheriff Smith,

1st. That it being necessary that the President, Vice Presidents and Officers of the Provincial Agricultural Association, shall remain in Office, for some time after the Annual Exhibition, to arrange and settle up the affairs of the Association, for the year during their tenure of Office, they shall for the present, and every future year hold Office till the first day of January.—*Carried.*

Moved by E. W Thomson, Esq., seconded by Mr. Sheriff Smith,

2nd. That H. Ruttan, Esq , of Cobourg be President of the Association for the ensuing year.—*Carried.*

Moved by E. W. Thomson, Esq., seconded by J. B. Ewart, Esq.,

3rd. That Jno. Wetenhall, Esq . be first Vice President.—*Carried.*

Moved by E. W. Thomson, Esq., seconded by G. D. Wells, Esq.,

4th. That Mr. Marks be second Vice President.—*Carried.*

Moved by J. Wetenhall, Esq., seconded by H. Ruttan, Esq.,

5th. That Mr. Buckland be appointed Secretary to the Association.—*Carried.*

Moved by J. Wetenhall, Esq., seconded by E. Mathews, Esq.,

6th. That in future one of the Banks be selected as Treasurer to this Association, and that the Bank of Upper Canada, be Treasurer for the ensuing year.

Moved in amendment by D. Smart, Esq., seconded by H. Ruttan, Esq., that the Local Committee, wherever the show be held be empowered to appoint their Treasurer upon his furnishing approved securities. On a division the original motion was declared.—*Carried.*

Moved by B. F. Davey, Esq., seconded by A. Douglass, Esq.,

7th. That the next Annual Show be held in Kingston.

Moved in amendment by W. M. Wilson, Esq., seconded by Jas. Covernton, Esq., that the next Annual Exhibition take place at the Falls of Niagara, provided the District of Niagara Agricultural Society promise to make all the requisite arrangements, and pay all the local expenses. The amendment and motion being put it was decided in favour of the original motion.

Moved by Thomas Briggs, Esq., seconded by Peter Davey, Esq.,

8th. That the next Annual Show be held on the first Tuesday in September.—*Carried.*

Moved by A. Dugall, Esq., seconded by P. Davey, Esq.,

9th. That a committee be appointed to draft a petition to the Legislature for a grant of money annually, in favour of the Association, and that E. W. Thomson, Esq., H. Ruttan, Esq., and J. B. Marks, Esq be such committee.—*Carried.*

Moved by H. Ruttan, Esq., seconded by E. W. Thomson, Esq.,

10th. That the report of the committee appointed to examine articles of American Manufacture exhibited be adopted, that this Association return thanks to the Americans who have honoured our show with their presence, and that a copy of this Resolution be forwarded to the President of the New York State Agricultural Society.—*Carried.*

Moved by John Wetenhall, Esq., seconded by Mr. Sheriff Smith,

11th. That a committee be appointed to meet at the city of Torontoon the first Tuesday in November next to audit the accounts of the Association, to collect all moneys due to the Association and pay off the liabilities of the Association, so soon as money can be obtained for that purpose, and that they be empowered to receive all books and documents connected with the Association and hand them over to Mr. Secretary Buckland, and that Messrs. E. W. Thomson, G. D. Wells and Richard Dennison, be such committee.—*Carried.*

Moved by the President, seconded by D. Smart, Esq.,

12th. That a committee be appointed to draft a memorial to the Legislature, in the name of this Association praying for the opening of reciprocal trade with the United States, in Breadstuffs, Stock and all Agricultural products, and that the President for the year 1849 and the two Vice Presidents, be such committee.—*Carried.*

Moved by W. Wilson, Esq., seconded by Mr. Sheriff Conger,

13th. That the thanks of this meeting be offered to the Officers of this Society for the past year.—*Carried.*

The indefatigable farmer, notwithstanding the late crops of wheat have failed to a great extent in some districts, through the blight or rust, is again busy in committing to the soil the seed for a future crop, in the expectation of a more favorable result, but we believe that generally, *Spring Wheat* will be more relied on than heretofore, whether wisely or not, can at present be but a matter of conjecture.

From accounts generally, we fear the root crops will be but light, more especially the carrot, the turnip, and the mangel. The continued drought of August put a stop to their growth in most places, which no future weather will enable them to recover, and in this neighbourhood, neither the roots nor the cabbage crop can show to advantage.

PRESERVING PORK.—The *Genesee Farmer* says: It is wrong to scald old brine for the purpose of salting meat, and that for eight years he assisted in putting down pork and pouring upon it the same brine without once scalding, and the older the brine the sweeter and better was the pork. The brine was always sweet, and had plenty of salt at the bottom. The pork was laid down in the usual manner with salt, and old brine poured back upon it. The advantages are a saving of labour and trouble.

Unfermented Bread.—I have used unfermented bread in my family for some time past. At first we made it by using the quantities of bicarbonate of soda and muriatic acid mentioned in the "Physician's" pamphlet, viz., to 3 lbs. avoirdupois of flour, 9 drachms of bicarbonate of soda, and 11½ fluid drachms of muriatic acid, apothecaries weight. We soon found a very great improvement both in the appearance and flavour of the bread by diminishing the quantities of soda and acid to less than one-third of the foregoing. As however it was by no means desirable to trust so powerful an acid in the hands of servants, in order to avoid the trouble of having to superintend the weighing and manipulation of the ingredients, I conceived the idea of using a dry acid, which combining with the soda would disengage the carbonic acid gas and produce a tasteless and harmless salt. After a considerable number of trials I have adopted the following mode of making the unfermented bread which is now regularly used in my house. I carefully mix by sifting with the flour first tartaric acid, and next bicarbonate of soda in the following proportions—viz.: to 14 lbs. avoirdupois of flour, 8 drachms of tartaric acid, and 11 drachms of bicarbonate of soda. Once mixed it will keep any length of time, and is always ready for use. Sufficient cold water to make it into dough rather thinner than ordinary, and immediate baking in a quick oven (either in tins or not) is all that is required to make it into bread. The superiority of this process over the former one is obvious. The bread is of excellent quality, and is much admired by all who have tasted it. I have 10 stones of flour at a time mixed with the two powders, the cost of which of the best quality for that quantity of flour is 1s. 8d., or 1d. for 7 lbs. of flour. For making brown bread it will be found necessary to use larger quantities, viz. 1 drachm of bicarbonate of soda with ¾ of a drachm of tartaric acid to each pound of meal. *P., Camberwell.*

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