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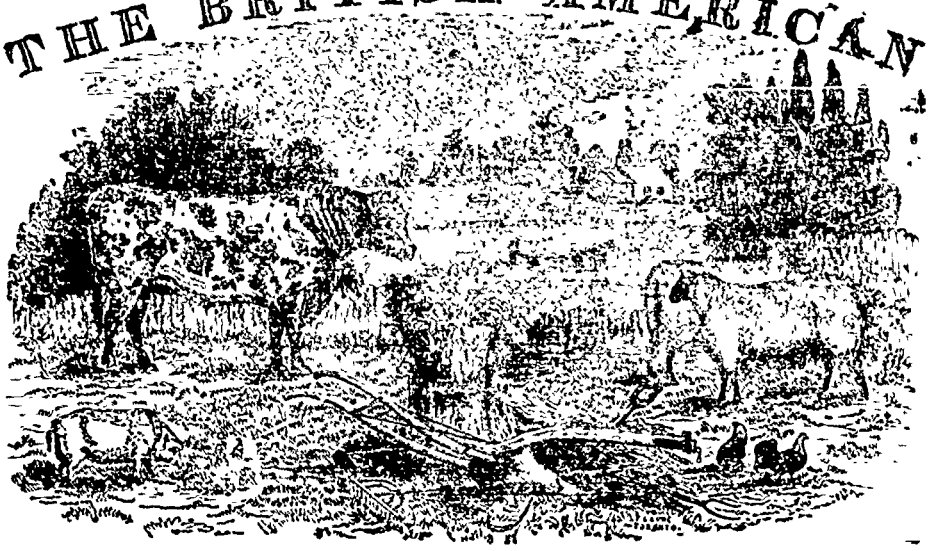

CULTIVATOR.

"AGRICULTURE NOT ONLY GIVES RICHES TO A NATION, BUT THE ONLY RICHES SHE CAN CALL HER OWN."—*Dr. Johnson.*

VOL. III. TORONTO, AUGUST, 1844. No. 8.

THE CULTIVATOR.

"Agriculture is the great art which every government ought to protect, every proprietor of lands to practice, and every inquirer into nature improve."—*Dr. Johnson.*

TORONTO, AUGUST, 1844.

MONTHLY CALENDAR.

The golden harvest now requires your earnest attention. In housing or stacking wheat, be cautious, and do not lead it before it be in good condition: the quality of the flour depends as much upon the style in which the grain is housed as upon any other influence. In this country, where the weather in the time of harvest is generally favourable, greater evils result from hurrying grain into the barn, before it be perfectly dry, than from a partial delay. Too much care cannot be observed in putting the wheat into shock while in the field: round shocks are preferable to long ones, as they are much more likely to stand during a heavy storm, and the caps, if properly fitted on, will turn a very heavy shower of rain. If you have both fall and spring wheat, by all means keep them separate, and when delivering them to the wheat-buyers, for the credit of both buyer and seller, do not sell spring for fall wheat, nor mix them in such a manner that only good judges could discriminate the imposition. Canadian flour in the English market now brings the highest price, and is at the present time more sought after by extensive dealers than formerly, and both producer and exporter should feel a pride in sustaining this high character of the principal staple product of the country.

Spring wheat flour for home consumption, and flour made from winter wheat for exportation, would prove a most profitable and economical arrangement, provided the same attention were paid in dressing the stones, and in preparing and packing spring wheat flour for market, as is bestowed upon fall wheat: the former would be worth as much for home consumption as the latter; and, indeed, it would command a higher price as soon as its merits became duly appreciated, as it contains a greater amount of gluten in a given weight of flour, and, consequently, will make more pounds of bread from a given weight of flour, than that manufactured from winter wheat.

The experience of the past few years has proved that spring is much more certain than fall-sown wheat; and, from our knowledge of the subject, we are led to the conclusion, that, for the future, about as many acres will be sown of the one as of the other.

If the present harvest proves as favourable as appearances indicate, we feel warranted in asserting, that the spring wheat crop will supply the home demand for Canadian bread-stuffs. This is as it ought to be; and we do not desire to see the cultivation of spring wheat extend farther than this, unless a variety should be introduced that would possess such superior flouring qualities, that the flour, when made, might be shipped to the English markets, in as safe a condition as flour made from winter wheat. It is said, by competent judges, that the Siberian spring wheat, which is now so generally spread through the country, will do this; and, if this should prove to be the case, it will be the greatest acquisition to the Canadian wheat-grower that has been introduced into this country in modern times.

Wheat and barley stubble may be profitably raked with a horse-rake, and the same implement would answer an excellent purpose for pulling peas.

If your barn should not hold all the grain, a portion will, of course, have to be stacked. Care should be taken in

executing this operation; and, as soon as the stacks are allowed to settle, they should be thatched by an experienced hand. But few departments of farm labour require more skill and minuteness than stacking and thatching, and in all cases where stacking becomes absolutely necessary, the stacks should be properly thatched, which is the only sure means of securing the owner from loss, and this operation should be performed immediately after harvest.

The final preparation of your land for wheat will now require a considerable portion of your time and attention. The diseases which cause so much casualty to the wheat crop in this country are rust, smut, and chess, and also the ravages of the wheat fly: to counteract these prejudicial influences should be the most anxious desire of every true friend to his country and to his fellow-man. As it regards the three former, which to the Western Canadian wheat grower are the most formidable, we feel prepared to say, that they might, in a great measure, be prevented,—indeed, as regards smut and chess, they might be unknown, unless it be as a matter of history. This doctrine, though strange to many, is, notwithstanding, strictly correct; and the writer feels so confident of this, that he is prepared to stake his reputation, as a farmer, in defence of the principle. The disease so generally fatal, and so universally dreaded in all inland agricultural countries, and which is known by the appellation of rust or mildew, might be rendered much less frequent than at present, if only the husbandman were sufficiently intelligent to exalt their high and noble calling to one of the exact sciences. But few persons, we are sorry to say, really know what constitutes a good wheat soil, and in hundreds of instances that have come under the writer's notice, where nature had done her part in such a perfect manner that the only necessary steps required to secure a good return was to plough and sow, without a large amount of skill, the system of farm management adopted upon such naturally good soils were so defective, that, in four cases out of five, the crops might be considered failures. An agriculturist should be so far master of his profession as to be able to compound and regulate his soils to suit the various crops grown thereon, with nearly the same precision and skill that a physician or a druggist employs in compounding and mixing their drugs in suitable proportions, to check the several diseases incident to mankind. Although this degree of perfection in agriculture is easily attainable, as it respects the knowledge of any of the most simple natural sciences, still it is to be feared that not one in a thousand of the sons of farmers, who are destined to take the place of their fathers—fathers who were the pioneers of this country, will take the necessary steps to acquire even a common-sense knowledge of the several influences which act favourably or prejudicially, as the case may be, on the occupation of an agriculturist.

A degree of knowledge sufficient to secure the introduction of a complete system of farm management in this country being attainable, every possible available means should be brought to bear, in diffusing such information to the rural classes of the country. As an humble, yet ardent votary to the cause of agriculture, the Editor of this Journal will spare no pains in his power to endeavour to elevate the standing of the class to which he feels proud to belong; and if the directions given be heeded, he flatters himself that the results will be favorable.

The subject of rust, chess, and smut, and a proper preparation of the land for the wheat crop, may be seen in another page of this number.

Points of a Good Milch Cow.—The following is from a report of the Guernsey Agricultural Society. *Points*.—1. Purity of breed and qualities of the dam for yielding rich and yellow butter. 2. Small head, large and bright eyes, small muzzle, small ears, orange-colour within. 3. Straight back from the shoulders to the tail, and chest wide. 4. A fine and loose skin, with soft and short hair. 5. Sides well rounded, flank small between the side and haunch, tail fine. 6. Fore legs straight and well proportioned, hind legs broad above the knee, fine and clean below; hoofs small; legs should not cross in walking. 7. Udder large, and the teats large and springing from the four corners of the udder; milk veins large and well defined.

Cheese.—A return of the quantities of cheese imported into the several ports of Great Britain in each month of the year 1843, distinguishing the European, United States, and Colonial produce, has been printed on the motion of Mr. Colville the member for Derbyshire. The aggregate importations from all parts during the year ending January 5, 1844, amounted to 179,389 cwt. From various countries in Europe, there was imported during the year, 136,898 cwt. From the United States of America, (whence very rich fine flavored cheeses are now being constantly imported,) 43,312 cwt., and from the British possessions abroad, only 79 cwt.—*English Farmer's Journal.*

Manures are to farming what blood is to the animal frame; divested of their aid vegetation languishes, as the abstraction of the other leads to dissolution. Of all manures that are in use, commend your friends I pray you, to that from the farm yard. Much goes to waste about every steading, that being otherwise carefully used, with a trifling amount of labour might be made available in superseding the use of artificial or foreign manures.—*Agr. Ag.*

MANURES.

A PRIZE ESSAY.

BY S. L. DANA.

[In the May Number of the *Cultivator* we inserted the Second Section of this admirable production, which we copied from an exchange paper: we at that time had no hope of obtaining the entire Essay, but since have been favoured with it, through the agency of the *American Farmer*, and have, accordingly, given insertion to the First and Third Sections in the July Number, and we now give the Fifth Section and part of the Sixth in the present Number for August; and we shall continue it in the subsequent Numbers of this Publication, until the whole is completed.]

Section Fifth.

Of the Action of the Salts of Cattle Dung.

Here it is we find ourselves thrown on a sea of opinions, without chart, compass, or pilot, if we trust to the conflicting theories which have been set up for landmarks and light-houses. Let us, therefore, reader trust to ourselves, aided by the little chemistry we have learned from the preceding remarks about the composition of salt.

I have endeavoured to impress on your memory, that the term salt is very comprehensive. But then, to encourage one it is also to be remembered, that salts are compounds of alkalies, earths, and metals with acids. Now the earths, alkalies, metals, may be united to each of the known acids, (and their name is legion,) yet you may not, by this change of acid, alter the nature of the earth, alkali, or metal. That always remains the same; every time you change the acid, you alter the character of the salt. Thus soda may be united to oil of vitrol and form Glauber's salt, or to aqua-fortis and form South American saltpetre, or to muriatic acid and form common table salt. The soda is called the base of this salt, that is always soda, you do not change its character by changing the acid. To give another example, lime may be united to carbonic acid and form chalk, or marble, or limestone, or it may be united to oil of vitrol, and form plaster of Paris, or to phosphoric acid and form bone-dust. Now, in each case, the base of the salt, that is, the lime remains unchanged; but, changing the acid, we change the nature of the salt, and of course its effects will be different. Now it is plain, that where the bases of the salt remains the same, that will always act the same, but different effects will be produced by different acids. Each base acts always one way, but each has an action to every other. Each acid acts also one way, but each has an action distinct from every other; impress this on your mind. Reflect upon it a moment,

and you will perceive that salts produce different effects, according to the nature of their acid. Now this may be illustrated thus: you take every day, probably, with your every meal, common salt, that is, soda, a base united to muriatic acid. Your digestion and health are all the better for it. You give your cattle a little salt. It does them good. Suppose you change the acid of that salt, leaving soda, its base, in the same quantity you daily take. Instead of the muriatic, suppose you use saltpetre from Peru, instead of common salt. You need not be told, that you would poison yourself and your cattle by so doing. You can drink, I dare say you have, cream of tartar punch. You feel the better for it. It is refreshing, cooling, opening. Now cream of tarter is a salt of potash; it is potash and tartaric acid. You have a fever. Your doctor gives you a sweet with Silvius's salt, that is, acetate of ammonia, a salt composed of that and vinegar; or you take, perhaps, an effervescing draught, formed of lemon juice and pearl-ashes. All does you good. But suppose now you change these cooling vegetable acids for a mineral acid, say oil of vitriol. You may not take potash, united with a dose of oil of vitriol equivalent to the tartaric acid in the cream of tartar, without serious injury. So is it, reader, in farming, the acids of some salts are not only harmless, but beneficial to plants; others are actual poisons. In the first case, salts help to nourish plants, as common salt help to nourish yourself; in other cases, they poison plants, just as they would impair your constitution, perhaps kill you. But it is to be remembered, as in our own case, even those that poison, in a small dose become medicines, so, in plants, a small dose is not only good, but truly essential. Now if we divide the acids into two classes, the nourishers and poisoners, such will also be the nature of the salts. When we therefore attempt such a general division of the salts, it may be said that all the acids derived from the vegetable kingdom are harmless; so are the acids called mineral, yet whose components are, in part, like those of the vegetable acids; for instance, aqua-fortis or nitric acid. But the true mineral acids are poisonous, such are oil of vitriol and spirits of salt. One thing is here to be borne in mind. It must never be out of sight, in trying to understand how salts make plants grow. You cast your salt upon the ground, it lies there no action occurs. It rains; your salt is dissolved and disappears; seems to do good. Cast your salt now among sprouting seeds and growing roots; here is life. Well now life is just as much a power or force as electricity is. It exerts its force, no matter how; that is quite another consideration. I say, life exerts its force here to separate the acid and the base of a salt, just like a chemical force. We can and do separate the components of salts by other substances; nay, we do it by electricity alone.

This is all that is necessary for you to know, and understand about this action of plants upon salts; it does disunite the components of the salts. What is the consequence? The alkali, earth and metal act as such, the same as if no acid was present. The acid acts by itself; if it is a poisoner, it hurts it. It produces either a healthy, green crop, the effect of alkali, or a stunted, yellow sickly plant, the effect of acid. Now neutralize this acid, kill it. You see your crops start into luxuriance, and reap where you have strewed. So much for illustration. Let us now apply this view of the action of salts to those contained in cattle dung. In the first place we have salts of potash, of soda of lime; these are the most abundant and active; then we have salts of iron manganese, of clay and magnesia. These last substances, existing only in small proportions, may be thrown out of the account, bearing in mind, however, that, though we set these aside, a plant does not; they enter equally with others into its composition. Let us begin with the salts. It is found combined in cattle dung, first, with a vegetable acid, the acid of mould. It is a nourisher of plants. Secondly, with sulphuric acid or the acid of sulphur, called oil of vitrol. This is one of the poisoners, existing only in small proportion in cow dung; it ministers to the wants of a healthy plant: The same is true of the common salt, or the muriate of soda of dung. If it existed in larger quantities, it would poison the plants to which it might be applied. The next salts are those of lime, phosphate, and sulphate of lime, or lime united to sulphuric and phosphoric acid, forming plaster and bone dust. The acids here, if abundant, would have a decided bad influence, they are poisoners; but the carbonic acid, in the carbonate of lime, is a nourisher. Now from the small quantity in which these all exist in cattle dung, they act only beneficially. But if you apply a great excess, even of cattle dung, you may be sure of an unfavorable result; It will be produced by the acids of those salts which we have called poisonous. To continue our remarks on the acids of salts of dung it is to be observed, that they act also upon the soil.

They decompose that. That is, they extract from the soil alkalies, or other substances, like those in the original salt. Now though applied, as they must be, in very small doses in cattle dung, yet because of their decomposing action on soil, they continually renew themselves, they last till their acid is taken up to supply the wants of growing plants. Let us now, reader, if you understand how the acids of the salts of dung act, turn to the bases or the alkalies and metals and earths of these salts. What is their action? What purpose do they serve in dung applied as manure? First they enter into and form a part of the living plants, they form a part of its necessary food, as much as do the constituents of mould. Secondly, when these alkalies and metallic bases are let loose, by the disunited power of a growing plant, then they act as alkalies upon mould. They hasten decay, render mould more soluble, fit it to become food for plants. This account of the action of mould and salts in cattle dung may appear to you, reader, long and hard to be understood. I do request you not to pass it over on that account. A patient reading, perhaps some may require two or more readings, will put you in possession of all you need know to understand the why and the wherefore of the action of mould, and salts of whatever manure may be used. What has been said of the action of mould and salt in cattle dung is equally applicable to all manures. If, then, you bend your bones to this subject, and master it, your labor of understanding the action of other manures will be reduced to the mere statement of the several substances which they may contain. We therefore proceed to point out other manures, composed of the droppings of animals.

Section Sixth.

Of Night Soil, Hog Manures Horse and Sheep Dung.

These have not all been analyzed with the same degree of care and as often as his cattle dung; some, as for instance, night soil, has been examined thoroughly but once. Now is it not quite fair to base our reasoning upon these single analysis, and say that this or that manure contains this or that salt in great or less quantity than another.

The quantity and kinds of salts are materially affected by several circumstances, which will be considered in the next section. An analysis, made when the animal is fed and worked one way, will vary from the result which would be obtained when the circumstances are varied. It is, therefore, quiet useless, in the general consideration of the composition of manures to enter upon the details of each. General results, general expressions of facts, are sufficient for understanding the nature of animal droppings. It is well ascertained, however, that all these droppings, of various animals, contain essentially the same salts as does cattle dung. They all contain portions of each of these substances which form plants. It will be enough for the purpose of this Essay, to present to your eye, reader, a table, showing the proportions of water, mould, and salts, which the dung of yourselves and your stock presents.

	Water.	Mould.	Salts.
Night soil and Hog Manure, ...	75.30	23.50	1.20
Horse dung, ...	71.20	2.700	.96
Sheep dung, ...	67.28	22.50	3.06

(To be Continued.)

Hoarseness.—One drachm of freshly scraped horse-radish root, to be infused with four ounces of water, in a close vessel for two hours, and made into syrup, with double its weight in vinegar, is an improved remedy for hoarseness: a teaspoonful has often proved effectual; a few teaspoonsful, it is said, have never been known to fail in removing hoarseness.

THRASHING MACHINES.

An inquiry was made, in a late number of the *Cultivator*, in relation to a convenient and portable Thrashing Machine, that might be propelled with two or more horses, and one that would execute its work with efficiency and dispatch, without requiring more than four or five able-bodied men to work it. We have lately received a communication from G. J. Mackellar Guelph, who informs us, that a machine, which he has invented, and which has been in extensive use in the Gore and Wellington Districts during the past three years, comes as near to the description of the one we were so desirous of introducing as anything possibly could be. For the gratification of our readers, we shall quote a few paragraphs from his letter:—

"Several of the owners of my machines have told me that they have not cost them one shilling for repairs during two or three years extensive use. A person who purchased one of my most modern improved machines travelled with it in the township of Nichol, during the last winter, and he told me, that, in some of the shortest days, he had thrashed three thousand sheaves of wheat, with four horses; and that the manner in which the work was executed gave great satisfaction. They will thrash rye, barley, oats, peas, and clover, for seed, advantageously, with two horses; and, in the old-settled parts of the country, this power will be sufficient for thrashing wheat; but in new settlements, where the straw is strong and harsh, four horses are requisite. The Hon. Adam Fergusson, who has had one for three years, has never used more than two horses for thrashing any description of grain. The acknowledged advantages of my machines over all spiked machines are, their lightness (the machine, complete for operation, only weighing 12 cwt.), simplicity, durability, and safety; thrashing the straw clean, and not injuring it for fodder; thrashing equally well with two, four, or six horses, at the pleasure of the owner. Mr. Gartshore is prepared to furnish any number of these machines, at his foundry, in Dundas, at $100 each. These machines are well adapted for small, as well as large farmers, as they are easily managed, and can be used with much advantage, with few hands."

Without prejudicing the public against any other description of machines than those here spoken of, we would recommend such as are in want of this almost indispensable implement to successful gram husbandry to write to Mr. John Gartshore, proprietor of the Dundas foundry, who would give them, we are certain, all the information in his power, regarding the merits of this implement.

From the description above given, we are inclined to the opinion, that Mr. Mackellar's improved thrashing machines will become extensively used, where portable machines are preferred to a stationary moving-power.

From the Niagara Chronicle.

ROADS AND ROAD MAKING.

We some time ago published an extract from a Hamilton paper, in which Plank Roads were condemned as things contemptible in every respect. Since then we have procured an extract from a Report made to the Board of Works by Messrs. Thorburn and Hall, who were in 1842 appointed commissioners to examine into the condition of the various roads in Canada West. This extract we annex, and it seems to us to dispose conclusively of the question whether plank or Macadamized roads are the cheapest.

After stating the details relative to the roads in the Home District, the Report says—

"From the preceeding returns of management and repairs, it appears that the sum of £438 11s. 3d. has been required during the 12 months for repair of 4 miles of Macadamized Road, while during the same period the sum of £15 4s. 1d., only has been necessary for repair of 13 miles of Plank Road; or at the rate of £109 13s. 3¾d. per mile per annum for Macadamized; or at the rate of £3 18s. per mile per annum for plank.

"But the above exhibit of expense is not the only difference that exists between Macadamized and plank: the former has from its comencement required an expenditure exceeding the above rate of £109 per mile per annum, whereas the latter, after remaining in use nearly 8 years, has only during the last season required repair as above stated; but admitting that on an average of 8 years £2 per mile in some cases may be required, and that the duration of plank will be 8 years, we have a general

repair for this period of ..	£16
Renewal of planks after 8 years, ...	400
Original cost of Plank...	400
Add to this 8 years' repair,	16
The whole cost of a mile for 16 years, ...	— £832

"Apply the same rule to stone—road formation and culvers equal in both cases:—

Original cost of 1 mile of Stone road, ...	£1555
15 years repair, at £109 per mile, ...	1635
	£3190

Difference in favor of plank at the end of 16 years, or saving to the public..... £2369

Thus nearly 4 miles of plank road can be made and maintained for one of stone.

The above calculation is intended for general demonstration. Interest has not been included on either side.

From the above data we may now examine what the correct proportion is between stone and plank for 8 years.

"The average orignal cost on the road east of Toronto of laying one mile of Plank and sleepers—16 feet wide and 3 inches thick—was £400; add 8 years compound interest £237 10s., and £17 for repairs, and the total is £654 10s. The original cost of one mile of Macadamized road is £1555: add 8 years compound interest £1072 10s, and for repairs on a moderate estimate £400, and the total is £3027 10s. It thus appears that a Plank Road will cost the public per mile for 8 years the sum of £654 10s., and for renewing the same the sum of £400, together £1054 10s., while a stone road for the same period costs £3027 10s.: in 8 years the saving to the public by constructing Plank instead of Macadamized Roads is consequently very little short of £2000 per mile."

From the New England Farmer.

BENEFIT OF MIXING SOILS.

Mr. Editor,—I was gratified with the communication of L. Bartlett, Esq. on Sulphuretted Hydrogen, in the Farmer of the 3rd inst. There is no doubt but *any* mixture of soils, or *any soil* from a considerable depth brought to the surface, will act efficiently as manure, and in *many* cases very powerfuly. Some 16 years since, I built a house, and the earth from the cellar was used for grading. The bottom dirt, which of course came on top, was a fatty blue clay, with a strong sulphur smell. At the east end it was proposed to have a garden, and I intended to haul on a covering of other earth, but other business prevented, and it was planted with cucumbers, squashes, &c. which, much to my surprise, exceeded every thing else in the garden, and for the three years I occupied it, it maintained its superiority.

A few years since, while walking in the lower yard of the Maine State Prison, I observed a patch of corn, cucumbers, &c. growing, so very rank as to induce me to ask the warden what was used for manure. He said, "Nothing, they were planted on earth dug from the bot-

tom of the quarry by some of the convicts, and nothing else was put on them." This was a light yellow loam laying between the joints of the lime-rock, and brought from a depth of 50 or more feet, and did not look as if any thing would grow on it.

I have within a few years fertilized a mere clay bank, by bringing on soil from the road-side; and *any* mixture of soils of different qualities, so far as my experience extends will improve the crops equal always to the expense incurred, and often much more. B

Kennebec Co., Me.

A WORD TO YOUNG MEN.

Wishing, and sighing, and imagining, and dreaming of greatness, said William Wirt, will never make you great. But cannot a young man command his energies? Read Foster on decision of character. That book will tell you what is in your power to accomplish. You must gird up your loins and go to work with all the indomitable energy of Hannibal scaling the Alps. It is your duty to make the most of talents, time and opportunities.

Alfred, king of England, though he performed more business than any of his subjects, found time to study.

Franklin, in the midst of all his labors, found time to dive into the depths of philosophy, and explored an untrodden path of science.

Frederick the Great, with an empire at his direction, in the midst of war, and on the eve of battle, found time to revel in all the charms of philosophy, and to feast himself on the luxuries of learning.

Bonaparte, with Europe at his disposal with kings at his ante-chamber begging for vacant thrones, and at the head of thousands of men whose destines were suspended on his arbitrary pleasure, had time to converse with books.

And young men who are confined to labor or business even twelve hours a day, may take an hour and a half of what is left for study, and which will amount to two months in a year.

Is that nothing? Ask Elihu Burret. Ask Simpson, the great mathematician. Ask Herschel, the first of astronomers. Simpson worked at the weaver's loom, and Herschel was a poor filer boy in the army. Ask the year 1844.

Let your own experiment of what can be done in one year settle the question, whether to acquire useful information by regular and hard study, be practicable or desirable."

RUST, CHESS, AND SMUT.

The great bane to successful wheat-growing is *rust*; and although it is now pretty generally admitted that the disease is caused by the bursting of the sap vessels of the plants, while the sap is in a state of rapid circulation, being produced from a close, warm, or humid state of the atmosphere; or by showers of rain, followed in close succession by hot sunshiny weather; still the mode of cultivating the land, to prevent the ravages of this enemy to the farmer, is not so generally well understood as it ought to be. In treating upon this, as upon all other Agricultural topics, it is quite impracticable to lay down any set of rules that could be applicably carried out in every instance; but we would wish to be understood to assert, that, in the great majority of cases where rust is most frequent upon the wheat plant, it might almost, if not solely be prevented, by a judicious system of management.

The best wheat land in the world is that description of soil where calcarious matter constitutes the principal proportion. On a farm in one of the southern counties of England, where seventy-five per cent. of the soil was composed of carbonate of lime or marl, and only a small proportion of the remaining 25 vegetable matter, an average crop of wheat equalling forty bushels per acre has been harvested for the past twenty years, on the four-shift system, without any perceptible deterioration of the fertilizing quality of the soil. It does not necessarily follow, because a soil containing such a large proportion of lime scarcely ever fails of yielding a good return of wheat crops, that a soil containing a less quantity, with skilful and scientific management, might not be equally productive. The exact amount of lime in the soil, to constitute it good wheat land, depends greatly upon circumstances. A soil containing equal parts of carbonate of lime, clay, sand, and vegetable matter is, probably, when all things are considered, the most productive and profitable land cultivated. Any farmer, when once acquainted with the true science and practice of husbandry may, in a few years, change the texture of his soil, be its original qualities what they may; and thus, in process of time, convert the most barren into the most productive soils.

A soil naturally deep with vegetable matter, to produce a crop of winter wheat, of a superior quality, should be ploughed deep, in order to give a proper consistency to the soil; and, unless the land is previously made very sterile indeed by constant cropping, a dressing of barn-yard manure would be likely to be prejudicial to the crop. As evidence of this opinion, the circumstance is worthy of notice, that, on all soils where there is the least vegetable substance, the crops, although comparatively short in the straw, are seldom, if ever injured by rust. It is also a notorious fact, that, on all deep black soils, winter wheat seldom comes to perfection: the rust is almost sure to catch it; and the owner of such a crop is almost sure to calculate largely upon the yield, if only it escape the rust. Much of the land that is sown with autumn wheat is not at all adapted to this crop, inasmuch as it contains too great an amount of vegetable or putrescent, and two small an amount of mineral matter. A soil of the quality just mentioned, averaging the depth of six inches, would, if sown with fall wheat, in nine cases out of ten, prove to be a failure, if ploughed only to the depth of the surface mould; but if it were practicable to mix about six inches of the sub soil with the surface soil, the two would become so closely blended together, that it would be most easily managed, and become a part of the most profitable land under cultivation.

On soils composed of nearly pure clay, or sand, the application of a liberal dressing of raw unfermented barn-yard manure would be of great advantage to the wheat crop; but when vegetable matter is the principal ingredient, in order to insure a good return, the addition of barn yard manure is not only unnecessary, but the sub-soil should be liberally mixed with the surface soil, as a means of imparting the proper food to the plant, to produce a hard outer coat to the straw, and also to lessen the chance of being removed and destroyed by the freezing and thawing which takes place at the opening of spring.

As the bursting of the sap-vessels of the plant is clearly the cause of rust, any operation that would have for its object the effect of hardening the straw would lessen the chance of the wheat-crop being attacked with this direful enemy to the successful and profitable cultivation of wheat. Depositing the seed in rows, either by a drill or ribbing plough, would have a tendency to impart this result, inasmuch as the air would have a free circulation among the plants.

Deep ploughing, where the sub soil contains any considerable amount of lime and potash, would also have a favourable influence upon the crop, as both lime and alkali will dissolve and separate the sand in the soil, even so minutely that the small particles may be conveyed to the stem of the plant, and thus form a harder outer surface to the straw that if putrescent manures alone were used.

There are so many influences that have a bearing upon rust, that it would occupy a whole number of this Journal to enter minutely into all the details; but suffice it to say, for the present, that no opportunity will be lost, or trouble spared, in placing this subject before the entire

Agricultural public, in such a light as to cause the remedy for this destructive disease to the wheat plant to be much less difficult than very many at present suppose it to be.

To sum up the matter, in conclusion, we would say, plough deep; apply the manure to the crop which immediately precedes the wheat crop; drain the land, either by the plough or spade, in such an efficient manner that the plants would not be apt to receive injury from excessively hot weather; sow early, and let it be done deep and in rows, when practicable, and top dress the crop with ashes or salt, in the spring, to cause the plants to ripen early.

CHESS.

Without the desire of a show of vanity on our part, we venture the assertion, that but few Canadian farmers have had a better opportunity of correctly informing their minds in relation to the doctrine of transmutation of grains than ourselves; and, without hastily forming our opinion, we have come to the conclusion, that just in proportion to the amount of chess sown with the wheat, or otherwise conveyed to the soil, will be the amount of this grain grown with the wheat crop. We hold that chess is a distinct species of grain, and, from the circumstance of its being similar in size, it is with much difficulty that it is separated from wheat. It is also a much harder plant than wheat, and, therefore, is seldom injured by winter and spring frosts, excessive wet or dry weather, or other casualties.

It is wrong to form hasty conclusions upon matters that have either doubt or mystery involved in their solution; and, from this conviction, we made the following experiment, five summers since, which resulted in a clear demonstration, that the laws of nature, in this instance, as in all others, were uniform and stable:—

We selected two acres of the best wheat on the farm, from which, after bestowing much time and trouble, we carefully separated every plant other than wheat, at the period whilst the wheat plants were in flower. The produce from these two acres was thoroughly cleaned with a fanning machine, and afterwards passed through a hand sieve, and steeped in brine sufficiently strong to buoy up an egg, the whole of which process thoroughly cleansed the seed, which resulted in a crop the following year equally free from disease and impurity. About three bushels of seed, which had undergone no preparation, were sown, however, for experiment, the produce from which had an abundance of both chess and smut.

To repeat what has been elsewhere stated, we have every confidence that both smut and chess may become comparatively unknown, unless it be as a matter of history; and that rust, in a majority of cases, may be obviated by the introduction of a rational system of cultivation. Such a system of cultivation will be found to consist in sowing good and properly-prepared seed, so far as the two former are concerned; and, as it regards the latter, the following will be found to have a considerable influence in lessening the chance of its baneful effects:—Manuring for the crop which immediately preceeds the wheat crop; deep ploughing; early sowing; liberal seeding, and depositing the seed in rows; and horse hoeing, are, according to our judgment, necessary steps to insure a good wheat crop, upon much of the worn-out wheat lands of the country.

The confidence which we express upon these disputed points may, in some instances, beget ridicule from those of our readers who may have been more regardless in examining into causes and effects than we have been; but to such we would say, try for yourselves, and travel no longer the blind road of tradition, but recollect that only slovenly and improvident farmers are above adopting the improved methods that men of science and deep research have pointed out.

As the operations upon which we treat, as a journalist, will, under the present arrangement, be tested, and the results duly and honestly reported by the Editor, the readers of this Journal should have increased confidence in adopting, as far as practicable, the suggestions therein made.

SMUT.

Various opinions are entertained regarding this disease, so common to the wheat crop. Some suppose it to be a fungous production; others, that it is the work of an insect; and others, that it is propogated by inoculation, in a similar manner that infectious diseases are communicated to the animal creation; but the real nature, origin, and habits of the disorder has hitherto eluded the researches of the most scientific inquirers of all nations; and, therefore, it would be presumptuous in us to be positive upon a matter in which there appears so much mystery involved. On one point, however, we feel certain, namely, that the remedy is most easy, and if it were generally adopted, a single smut-ball would not be raised where there are bushels grown under the old slovenly system of preparing the seed. In every neighbourhood there are more or less careful farmers, who seldom, if ever, have their wheat crops infected with this disease; from such farmers seed shou'd be procured; and, independent of its being good, and free from disease, it should be steeped in a solution of stale urine and water, or a brine made of salt and water, sufficiently strong to buoy up an egg. The liquid in the tub should be a few inches higher than the grain, so as to allow it to be stirred, in order to bring all the light grains to the surface, from whence they are to be skimmed off, so long as they continue to rise. If baskets with handles were used, to immerse the wheat in the tubs, it could be conveniently taken out and drained. The seed should be left in the steep about two hours, after which it should be drained, and spread thinly on the floor of the granary, which should be well sprinkled with sifted quick-lime, fresh from the kiln, and which had been recently slaked with a small portion of the liquor. About half a peck of lime is sufficient for a bushel of wheat, and it should be carefully mixed, in order that every grain may be completely coated. It may sometimes happen that seed entirely free from smut cannot be procured, but when instances of this kind occur, a solution of one pound of blue vitriol to eight quarts of water should be applied, when quite hot, to three bushels of wheat, and the whole should be frequently stirred, and dried with lime. Sulphate of copper, in the proportion of five pounds to three bushels of wheat, is frequently used with good success; it should be dissolved in a sufficient quantity of water to cover the seed. After being repeatedly stirred, and cleared of light grains, it should be suffered to remain in the liquid about four hours, and then dried in lime, as mentioned above.

Various other preparations of vitriol, nitre, sulphur, arsenic, &c., may be used, with a probable certainty of success; but, instead of trying needless preparations, it would be decidedly better to procure seed free from the disease, and steep it in stale urine or brine, and apply lime, as previously directed.

By carefully preparing the seed, and by practising almost absolute cleanliness in the operation, the disease of smut, so detrimental to the farmers' profits, may be wholly avoided.

PHILOSOPHY OF MANURES.

To the Editor of the New York Farmer & Mechanic.

SIR,—Since the cultivation of the soil, in some form, and on a scale more or less extensive, may be regarded in this country as a universal profession, the Philosophy of Agriculture therefore, among us, should constitute a portion of every man's stock of knowledge, for without some acquaintance with the subject, few, in whatever station they may be placed, can discharge their duties as American citizens, or rightly appreciate the means to promote the best interests of the nation.

Endeavouring to carry out these principles, I am induced to write the following:

Agriculture is the true foundation of all trade and industry, it is the foundation and riches of the State. This being so self-evident, it will be needless to attempt any preliminary remarks on the benefits of the same—but a rational system of agriculture cannot be formed without the application of scientific principles, as such a system must be based on an exact acquaintance with the means of nutrition offered to vegetables, and with the influence of soils and manures upon them.

This knowledge we must seek from chemistry.

The greater part of all vegetables consists of but four elementary substances, namely, *carbon*, *hydrogen*, *oxygen* and *nitrogen*, and often of the three first alone, while the remainder is composed of certain salines, earthy, and metalic compounds, which form the ashes that remain when vegetables are burned. The former are called the organic, the latter the inorganic elements, and it has been ascertained that the latter, although occurring in very small quantities, are as essential to the development of the plant as are the former. The material question therefore arises, what are the best means of supplying these constituents for the use of the plants?

With regard to the carbon of plants, the general opinion was, that it originated in the substance called *humus*, a vegetable mould which is present in all fertile soils, and which is merely the remains of former vegetation, in a state of decay. This substance, either alone or in combination with lime, and other alkalies, was believed to be absorbed by the roots, and thus to furnish *carbon* to the plant.

But this view, by recent experiment, has been shown to be quite untenable; and that in the economy of nature the supply of carbon to plants, is beautifully associated with the restoration to the atmosphere of the oxygen, removed from it by the respiration of animals and other causes, and thus preserves the air constantly, in the same state of fitness, to supply animated life.

Proving from analysis the properties of *humus*, it is found that it cannot yield to vegetables, in the most favourable circumstances, more than a mere fraction of their annual increase of carbon, and that, notwithstanding the variety of forms and substances, the average amount of carbon produced on an acre of land, is exactly the same, viz., about 100 barrels per annum.

It has been said, that in the fields and orchards, all the carbon removed, as herbs, straw, seed or fruit, is again replaced by manure, and yet this soil produces no more than the first or maiden, which was never manured at all. It is therefore certain that carbon must be derived from some other source, and if the soil does not produce it, it can only be extracted from the atmosphere.

In attempting to explain the origin of carbon in plants, it is not considered that this question is intimately connected with the origin of humus. It is universally admitted that humus arises from the decay of plants. No primitive humus could therefore have existed, for plants produce humus. Now, where did the first vegetables obtain their carbon, and in what state is carbon contained in the atmosphere?

It is quite evident that the quantities of carbonic acid and oxygen, in the atmosphere, remain unchanged by lapse of time, therefore, they must stand in some fixed relations to one another. a cause must exist; which prevents the increase of carbonic acid, by removing what is continually produced, and there must be some means also of replacing the oxygen, which is removed from the atmosphere by the respiration of animals, combustion, &c. Both these causes are united in the process of vegetable life. Now, carbon exists in the air only in the form of carbonic acid, or carbon united to oxygen.

It has been already mentioned that carbon and the elements of water, form the principal constituents of vegetables, the generality of the substances which do not possess this composition, being proportionably very small, and the relative quantity of oxygen in the whole mass of vegetables, is less than in carbonic acid. It is therefore certain that plants must possess the property of decomposing carbonic acid, since they appropriate its carbon to their own use, the oxygen being returned to the air, while the carbon enters into combination with the water or its elements, plants thus affords a continual source of pure oxygen which supplies the loss that the air is constantly sustaining—animals on the other hand *expire* carbon, (in the form of carbonic acid) which plants *inspire*, and thus the medium of the air is preserved constantly unchanged.

We must now briefly allude to what is the source of *nitrogen* in plants. This element is highly important as being an essential part of those vegetables which serve as food to men and animals.

Nitrogen is also supplied to the atmosphere in the form of ammonia, when the land is unmanured, but on the other hand, the chief use of animal manure is to yield more ammonia than the earth can furnish, and for this purpose the kinds of manure are the best, which contain the largest proportion of ammonia or nitrogen. Hence the high value of liquid manure to solid, the former containing more nitrogen than the latter. Thus 100 part of wheat grown on land manured with cowdung, a manure containing the smallest proportion of nitrogen, affords only 11 97-100 parts gluten, while the same quantity grown on a soil manured with human urine, which is very rich in nitrogen, yields the largest proportion yet found, viz. 35 1-10 per cent.

These ideas if carried into practical effect may be of inestimable benefit to the agriculturist, and thereby to the whole people and nation.

Yours truly,

C. W. S.

New York, June, 1844.

BIRDS vs. CATERPILLARS.

On Sunday we saw, from our parlor window, on the top limb of an apple tree, a caterpillar's nest that had escaped the general havoc that had been made of their edifices two weeks before.

In a moment after a beautiful little red robin alighted, and without ceremony began to pillage the contents of the nest. How many worms were abstracted we cannot say, but on examining the nest we found as many holes perforated in it as you will see in an old target that has been fired at.

We have not quite enough robins in this vicinity to do the whole business, but they aid us much. When we have once been over the trees and broken up the nests, the birds find it easier to make an impression. If, in any New England district, there are more rot ins than caterpillars, drive them this way, if you please, and we will feed them gratis.

The cherry birds have already made our canker worms scarce. If you would have these worms multiply again, kill off the cherry birds in June; it will cost you nothing but powder, and shot, and time; while you will have the pleasure of mangling your cherry tree limbs and destroying more fruit than the birds would carry off.—*Massachusetts Ploughman.*

Yeast.—Boil one ounce of hops in four quarts of water until the hops fall to the bottom of the pan, strain, and when milk warm, add six ounces of flour and five of sugar; set the mixture by the fire stirring it frequently; in 48 hours, add four pounds of potatoes, boiled and minced fine; next day bottle the yeast—it will keep a month. One-fourth of yeast and three of warm water, is the proportion for baking.—[The editor of the Chronicle states that he has tried this recipe and found it good.]

Valuable Salve.—Take three carrots and grate them; place in a vessel and cover with lard, without salt. Boil thoroughly, strain and add sufficient bees-wax to make a paste. This is a most invaluable ointment or salve, for cuts, burns, scalds, or wounds of any kind.—*Saturday Courier.*

Peach Trees.—Screenings of anthracit coal are a good protection of peach trees against worms. Place around each tree, box two feet square and six inches deep and fill it with the coal; and they have indication of worms about them.—*Jerseyman.*

PHILOSOPHY OF WHEAT CULTURE.

No apology need be made to our readers for the number of articles we have given of late, of a character similar to the following:—

The Philosophy of Wheat Culture is a subject pre-eminently demanding the investigation of reading and thinking farmers, at the present time; and we are happy to know, that quite a number, especially of young farmers, are begining to devote much study to this science.

We are aware that the terms *science* and *philosophy*, in connection with wheat culture or any other branch of the farmer's art, only excite a *sneer* in the minds of some; but let them sneer as they please, it is nevertheless true, that the time is speedily coming, in this and other countries, when farming can no longer be prosecuted with advantage except by those who have made themselves familiar with the principles of science and philosophy, and understand how to apply those principles in their practice of the great art of agriculture.

The following article was prepared by our friend "D. L." and read at one of the agricultural meetings recently held in the State House, at Albany.

"Mr. President:—The question for investigation, this evening, I believe to be this:—'Is it practicable, and if so, will it be profitable, to grow wheat south of the limestone strata that extend west to Lake Erie, through the central portion of this State?'

"The soil in the region alluded to is based on shale and free-stone rocks, and, lacking lime, its sulphates and phosphates, it is but poorly adapted to wheat culture.

"Practically, then, the question to be solved is this:—How much lime, sulphur, and phosphorus must be added to the shale and free-stone soils, in the southern tier of counties, to make them good wheat lands, and what will be the expense per acre?

"If we take 100 lbs. of ripe wheat, including root, stem, and head, and burn it in the open air, about 97 per cent. of its weight will be converted into vapor and gas, and escape into the atmosphere. The ash, or 3 per cent. left, will, on analysis, show the earthy elements necessary to produce this grain. Liebig and Johnstone both quote the following anaysis, made by Sprengel, as ent'tled to confidence:—

	Wheat ash.
Potash	0 6
Soda	0 8
Lime	6.8
Magnesia	0 9
Silica, (flint)	81.6
Alumina, and oxide of iron	2 6
Phosphoric acid	4 8
Sulphuric acid	1 0
Chlorine	0 9—100 00

"When it is recollected, that there is never more than three or four per cent. of the above earthy substances in wheat, and that Silica (sand) composes 81.6 per cent. of even that small portion, it will not, I trust, be deemed incredible if I express the opinion that, by the aid of a little practical science, good wheat may be grown profitably in any county in the State.

"This plant has been raised in a great variety of artificial soils, where each ingredient was carefully weighed, both before and after the plant was taken from the earth. By careful analysis, what the soil had lost, and what the plant had gained, was susceptible of demonstration. A very large portion of the elements of all cultivated plants come from the atmosphere. The precise amount depending alike on the composition of the soil and the nature of the particular plant upon which the experiment was made.

I regard it as a fact of great practical importance, that wood-ashes, (even leached ashes, so abundant in the southern tier of counties,) contain all the earthy elements of this invaluable bread-bearing plant. Compare the following table, showing the constituents of beach ash, with that of wheat ash,—(this is also taken from Sprengel:)—

	Beech ash.
Silica, (sand)	5.52
Alumina, (basis of clay)	2.33
Oxide of iron	3.77
Oxide of Manganese	3.85
Lime	25.00
Potash	22.11
Soda	3.32
Sulphuric acid	7.65
Phosphoric acid	5.62
Chlorine	1.84
Carbonic acid	14.00=100.00

"Maple, birch, and other wood, contain the same minerals.

"Note the 25 per cent. of lime, in the above analysis, being larger than that of potash. Our primitive forests have been for centuries drawing the above earthy constituents of wheat from the soil; and instead of carefully preserving this indispensible *raw material* of good wheaten bread, thousands of bushels of leached ashes have been thrown away! Being but slowly decomposed by the vital action of plants, ashes are an enduring fertilizer when compared with stable manure. Mixed with quick lime, their good effects are more speedily obtained. Lime will render alumina, either in the soil or in leached ashes, soluble in water, so that it can enter the minute pores of roots. Clay in the soil is always combined with a large portion of silica; and before it has been exhausted by continual cropping, it holds in combination considerable potash and soda. Lime, by combining with alumina, the basis of clay, liberates these alkalies and silica, which uniting chemically, form soluble silicates of potash and soda. These also enter into the circulating nourishment of plants, and are decomposed in the stems of grasses and cereals. The silica goes to make vegetable bone, to keep the plant upright; while the potash and soda go back to the earth, to dissolve, as before, another portion of *sand*, to be also absorbed, and transformed into *bone*. It is in this way that a few ashes, applied to a sandy soil, will enable grass and grain to take up the 81 per cent. of flint found in their ashes. Lime will do the same thing on clay soils, for the simple reason that they generally do not lack potash, soda, and magnesia.

"The quantity of lime and ashes to be applied to an acre, will depend entirely on their cost at the place where they are to be used. A few bushels will be of essential service; but a larger dose will be better.

"I come now to speak of the organic elements of the wheat plant, which as I have already intimated, form 96 to 97 per cent. of its substance. Water and its constituents, oxygen and hydrogen, carbon and nitrogen, are the four elementary ingredients of all cultivated plants, beside their minerals. As there is no lack of water or of its elements oxygen and hydrogen, our attention will be confined to obtaining a full supply of carbon and nitrogen. These are indispensible, and fortunately nature has provided an amount of carbon and nitrogen in the air, if not in the soil, more than equal to all the wants of vegetation. A large portion of the fertilizing elements of vegetable mould, in a rich soil, is carbon, and a small portion is nitrogen; both of which are usually combined with other substances. These important elements are often nearly exhausted in fields which have been unwisely cultivated; and I have paid much attention to the subject of cheap and practicable renovation.

"By the aid of clover and buckwheat dressed with gypsum, ashes, lime, or manure, and plowed in when in blossom, much can be done in the way of augmenting the rich vegetable mould so desirable, to a certain degree, in all soils. Straw, corn-stalks, leaves of forest trees, and swamp muck, made into compost with lime and ashes, are of great value. Charcoal well pulverised, and saturated with urine, I regard as the cheapest and most useful fertilizer that can be applied to a poor soil, for the production of wheat or almost any other crop.

"The earths contained in charcoal, as the analysis of its ash demostrates, are identical with the earths found in the wheat plant. Coal contains a very large portion of carbon, and will imbibe from the atmosphere a large quantity of nitrogen in the form of ammonia and its carbonates. Unlike stable manure, the salts of lime, potash, soda and magnesia, it will not waste by premature solution nor by evaporation. On the contrary, it is of incalculable value to mix with the liquor and solid excretions of all animals, to absorb and fix in a tangible condition those volatile, fertilizing elements, which are so prone to escape beyond our reach.

"When it is recollected that without nitrogen in some form it is utterly impossible to grow one kernel of good wheat,

and that a pint of human urine or four quarts of that of the cow, or one quart of that of the horse fed on grain, contain nitrogen enough to supply 60 lbs. of wheat, we may begin to understand something of the money value of this animal product. But mind this suggestion. Nothing is sooner lost than the hartshorn in an open smelling-bottle, or a large share of the ammonia in free urine in a warm atmosphere. Charcoal and gypsum will absorb it in large quantities, and give it out at the roots of plants as their wants require. In feeding plants, great judgment should be exercised. At least one-half of the food fed out to them in the shape of stable and barn-yard manure, is entirely lost. It escapes into the air, or is dissolved prematurely, and carried like the potash in water running through a leach, beyond the reach of your hungry, if not starving plants.

I have just separated a half pound of wheat-flour into its proximate elements of starch and gluten. The gluten I have in my hand. It is nearly identical with animal muscle. It forms from 7 to 35 per cent. of bulk of wheat kernels. The more gluten flour contains, the more good bread a given number of pounds will make. A barrel of flour rich in gluten, will make 10 per cent. more of bread than one which is nearly all starch. Gluten will bear far more water than starch. The quantity of this meat-forming principle in wheat, depends in a good degree on the quantity of nitrogen in the soil where the wheat is grown."

From the London Gardiners' Chronicle.

THEORY AND PRACTICE OF MANURING LAND.

Under this head I propose to discuss the best means of retaining or increasing the fertilizing properties of manures.

Plants, having no power of locomotion, must have their food supplied to them upon the spot where they grow. Now, as from nothing it is clear nothing can be made, so is it equally certain that the grain, leaves, straw, and roots of a stalk of wheat must have derived the materials of which their fabric is composed from the earth, in which the straw, leaves, and grain grow. Now, we have only to apply the same truth to different parts of which a plant is composed, and instead of saying that as a whole it derives its material from the earth or air, we prove that it must have carbon and the elements of water for its starch and sugar, an addition of nitrogen for its gluten or albumen, phospate of lime and magnesia for the husk of its seed, and silicate of potash for its straw; and we have only further to prove that these element must be present for one crop, and with variations or omissions are essential for another, and also that by the addition of individual elements, we can increase the quantity of individual produce, as azote for gluten, carbonaceous matter for starch,—we have only to prove this, and we arrive at once at the foundation of Agricultural Chemistry, at the basis of those great principles which must ever guide the scientific farmer, in a judicious application of measures—the food of plants. A moment's reflection, too, will convince any one who thinks it worth while to consider the subject at all, that cause of failure, which we so often hear of in the application of manures, arises from the want of attention to these principles.

Let us take an ensample:—A farmer is anxious to try a certain manure: we we will say nitrate of soda or potash. He applies it to his land according to the prescribed rules of so much per acre.

Now the nitrate acts as a manure principlly, if not entirely, by supplying the the alkali, soda, or potash to the soil. The Cerealia (wheat, barley, &c.) exhaust the soil of alkali, because a union of it with silicic acid is necessary for the stiffness of the stalk; and this, I may observe, *en passant*, is the cause of the green, rank appearance of the grain crops to which the nitrates are applied.

But it my happen, and does frequently happen, that there is no deficiency of alkali in a soil. Now in such a case it is obvious that the application of the nitrate must fail. Another farmer applies it where the alkali is deficient, and it succeeds: hence the discordance in experiments, of which we hear so much.

I will take a second exemple:—A crop of turnips, or mangel-wurzel, or potatoes, is manured, in part, with guano and azotised manure, and the crop from the last named is the best. Another crop of wheat, barley, or beans, shall be manured in a similar way, and that from the guano succeed best. Now in these cases the results are strictly in accordance with chemical facts; and yet the experimenter who fails on the turnip crop, rejects the guano as a useless expenditure.

There is another source of apparent failure and consequent disappointment in the use of guano and artificial manures, which cannot be too strongly dwelt upon: I mean the fallacy of judging the effect of manures by appearances. If what is manured with rotten stable manure and guano, or urine, the plants from the stable manure will have the freshest, greenest, and strongest appearance; but notwithstanding this, the grain from the guano will be the best sample, superior both in quality and quantity to that in the other experiment.

Experiment, sound co-operative experiment, is the means by which these principles can be proved true or false; but no good results will ever be obtained by putting a bushel of this or that manure at random upon the first crop that comes to hand, and judging of the result from mere appearances; on the contrary, much mischief may arise, and a certain retardation of one of the most interesting and important of the sciences to Agriculture. Mr. Pusey was, to a certain extent, right when he stated that the experiment of the Duke of Richmond was the first real contribution of Chemistry to agriculture. But this was not the fault of the science, but of those who have undertaken experiments An experiment, as Liebig has observed, is the expression of a thought; and whether this thought is that of the chemist or the farmer, it is quite impossible to prove its soundness unless the minutest details are attended to.

C. R. Bare.

A GOOD ORCHARD.

Every farmer who is not in posession of a good orchard, should set about planting one. The profit and convenience of an orchard are almost invaluable to the farmer—good fruit will always sell if he happens to have a surplus, and a plenty of fruit takes away the appetite for intoxicating drink—this is a fact which cannot be too often repeated.

To him who has a great plenty of land and great variety of surface, I would advise for an orchard, a valley between hills if possible, so that the wash from the land surrounding may always tend to the orchard—and the winds may be impeded, by the hills, from visiting the orchard too roughly.

There has been great diversity of opinion upon the distance of planting trees from each other—some have contended that the distance should be four rods, that the sun and air may have full influence on every tree, and every part of it—others have contended that a distance much less is better. My own experience and observation is in favor of close planting, so that by the time trees have got to their usual size, the limbs of them shall meet and interlock each other, and the ground underneath will be perfectly shaded. Trees thus growing will produce larger and finer fruit, and ground thus shaded will not be likely to be sapped with the growth of grass or weeds, nor parched or dried by the sun.

A young orchard should always be kept under cultivation—it will make an excellent potato field for many years provided it is well manured—and when it has become so shady that potatoes will not grow, then keep it for a summer retreat for your hogs. The hogs will keep in good health upon the poor apples that fall from the trees, and the worm that calculates on a resurrection in the form of a curculio, finds nought but annihilation in the jaws of swine. Therefore the result is, after a few years, fine fruit without wormy apples.

Although the last season was a very good one for fruit, yet there was not enough raised in our State to supply the demand, and 15,000 barrels were brought down on the western railroad to supply the demand in Boston.

We never need fear raising two much fine fruit—for when such a contingency happens, by the aid of steam we can seek a market in the islands of the ocean, or across the Atlantic, where American fruit is always cheerfully and well received. *Massachusetts paper.*

ON THE EFFECTS OF SOAKING SEEDS IN CHEMICAL SOLUTIONS.

(Abridged from the Scottish Journal of Agriculture.)

There was perhaps no object in the exhibition of crops in the society's show, at Dundee, in August, 1843 which attracted such general attention as the remarkably strong and vigorous oats growing in soil, exhibited by Mr. James Cambell, of the Educational Seminaries of that town. The soil on which they grow possessed no peculiar property, except that it had not been manured for eleven years. The vigour of the plants, according to Mr Cambell, was entirely to be ascribed to their seed having been subjected to a process by which they were soaked in certain chemical solutions. Mr Cambell has, since the show, in the most liberal and disinterested manner, placed the particulars of his process in the hands of the society, for the benefit of agriculturists generally, and to further his good intentions, the society has thought it proper to publish his own explanation of the method of conducting the process of preparing the seed as it is given in a letter to the secretary.

"I steeped the seeds of the various specimens exhibited in sulphate of ammonia, in nitrate of soda and potass, and in combinations of these: and in all cases the result were highly favourable. For example—seeds of wheat steeped in sulphate of ammonia on the 5th of July, had by the 10th of August, the last day of the show, tillered into nine, ten, and even eleven stems of nearly equal vigour: while seeds of the same sample, unprepared, and sown at the same time, in the same soil, had not tillered more than two, three, and four stems.

"I prepared the various mixtures from the above specified salts exactly neutralized, and then added from eight to twelve measures of water. The time of steeping varied from fifty to ninty four hours, at a temperature of about 60 degrees Fahrenheit. I found, however, that barley does not succeed so well if steeped beyond sixty hours.

"Rye-grass and other gramineous seeds do with steeping from sixteen to twenty hours, and clovers from eigth to ten, but not more; for, being bilobate, they are apt to swell too much and burst.

"The very superior specimens of tall oats, averaging one hundred and sixty grains on each stem, and eight available stems from each seed, were prepared from sulphate of ammonia. The specimens of barley and bere were prepared from nitrate of ammonia, the former had an average of *ten* available stems, and each stem an average of thirty four grains in the ear: and the latter an average of also ten available stems, with seventy-two grains in the ear.

"The other specimens of oats which were next the most prolific, were from muriate of ammonia; and the promiscuous specimen of oats were from nitrates of soda and potass—strong, numerous in stems (some having not less than fifty-two), and not so tall as either the preparation from the sulphate or muriate of ammonia.

"It was objected by some that the tallest oats were too rank, and would break down before coming to seed; but have not any of that, as they were strong in proportion to their height, and I am confident that a combination of sulphates of *ammonia and soda*, or potass, would rectify the excess of height, and render the grain equally productive.

"I have at present a series of experiments going on in the country, with seed prepared in 7 different ways, and sown in pure sand, and in a tilly subsoil taken six feet under the surface, and in which there is no humus or organic matter of any kind. Along with the prepared seeds are also some *unprepared* and I expect to be able to form a comparative estimate of their growth by visiting the place in October.

"At all events, from the experiments which I have already tried, I am quite satisfied that, even *without* the application of manures, double crops, at least, may thus be raised; and under the application of the ordinary manures, crops *tenfold* greater the usual.

"The various salts were prepared by me from their carbonates.—Iam, &c."

From the Albany Cultivator.

FOOD FOR WORK-HORSES TREATMENT FOR "HEAVES."

Mr. E. H. Northrup, of Shoreham, Vermont, inquiries "What is the best mode of feeding the roadster and work-horse?" "Is there any cure for heaves?"

We do not find the disease here called "heaves" described by that name in the English Works. The disease described under the terms *chronic cough, thick wind, broken wind, wheeze, roaring*, &c., we are inclined to think are in this country frequently confounded under the term "*heaves.*" They are all in a greater or less degree, affections of the lungs. The best food for horses so affected, is that which is nutricious, rather succulent, and condensed into a small compass. Dry food, entirely especially a large quantity of poor or dusty hay, is very bad for them. Vegetables such as potatoes, ruta-bags, carrots, &c., are very good. The preference is by some persons given to carrots, but we have tested the good effects of potatoes in such cases, and would recommend their use where carrots cannot well be had. The horse's stomach should not be crowded, and he should be only moderately exercised, especially soon after eating. We have known horses that were said to have the heaves, or to be broken-winded, perform a great deal of labour, with proper feeding and use, for several years, but a radical cure is not to be expected.

In reference to the inquiry about feeding, we remark, that the practice of "chaffing" or cutting the fodder and mixing with it the grain, (the latter in a ground state,) is highly approved, and is daily coming to be more adopted. Hay and straw may be cut together, if desired and if the horse is not hard worked, a great saving may in this way be made.

Youatt, in his Treatise on the Horse says—"Chaff may be composed of equal quantities of clover, or meadow hay, and wheaten, oaten, or barley straw, cut into pieces of a quarter or half an inch in length, and mingled well together; the allowance of oats or beans is afterwards added and mixed with the chaff."

He advises the bruising or grinding of the beans and oats. In this country, indian corn might be properly substituted for beans. Mr Lorat says the *prejudice which some have evinced* against bruising the oats is, "so far as the farmers horse and the wagoner's is concerned, altogether unfounded. Horses of quicker draught except they are naturally disposed to scour, will thrive better with bruised, than, with whole oats; for a greater quantity of nutriment will be extracted from the food, and it will always be easy to apportion the quantity of straw or beans to the effect of the mixture on the bowels of the horse. The principal alteration that should be made on the horse of harder and more rapid work, such as the stage-coach horse, &c., is to increase the quantity of hay and diminish that of straw. Two trusses of hay may be cut with one of straw. For the agricultural and cart horse, eight pounds of oats and two of beans should be added to every *twenty pounds* of chaff: and *thirty-four or thirty-six* pounds of the mixture will be sufficient for any modern exercised horse, with fair or even hard work. The dray and wagon horse, may require forty pounds. Hay in the rack at night is supposed to be omitted altogether * * *

"Horses are very fond of this provender. The majority of them, after having been accustomed to it, will leave the best oats given to them alone, for the sake of the mingled chaff and corn. We would however, caution the farmer not to set apart too much damaged hay for the manufacture of the chaff. The horse may be thus induced to eat that which he would otherwise refuse; but if the nourishing property of the hay has been impaired, or it has acquired any noxious principle the horse will either lose condition, or become diseased. More injury is done by the eating of damaged hay or musty oats than is generally imagined. There will be sufficient saving in the diminished cost of the provender by the introduction of the straw, and in the improved condition of the horse, without *poisoning him with the refuse* of the farm.

"While the mixture of chaff with the corn prevents the corn from being too rapidly devoured, and a portion of it swallowed whole, and therefore the stomach is not too loaded with that on which as containing the most nutriment, its chief digestive power should be exerted, yet, on the whole, a great deal of time is gained by this mode of feeding, and more is left for rest. When a horse comes in wearied at the close of the day it occupies after he has eaten his corn, two or three hours to clear his rack. On the system of manger-feeding, the chaff being already cut into small pieces, and the beans and oats bruised, he is able fully to satisfy his appetite in an hour and a half. Two additional hours therefore are devoted to rest. This is a circumstance *deserving of* much consideration even in the farmer's stable, and of immense consequence to the postmaster, the stage-coach proprietor, and the owner of every hard worked horse."

We have known several establishment where a considerable number of horses were kept entirely for the road, and fed wholly on cut hay with corn meal mixed with it. A sufficient quantity of hay is thrown into a large through, wetted a little, and the due proportion of hay mixed, and stirred well together. Corn and cobmeal does well.

In answer to the question of our correspondent, "What food will fatten a horse quickest?" we reply, good sweet clover hay, free from dust, cutted with all the heads and leaves on, with boiled potatoes and meal, or instead of the meal boiled oats, *will fatten a horse very rapidly; and where* the object was merely to fatten him, he would use this food.

From the American Farmer.

ALTERNATION OF CROPS.

This in unquestionably one of the best and most economical means of preserving fertility, and of increasing the profits of the farm. All crops exhaust the soil more or less, of the general elements of fertility, though all do not exhaust it alike of certain specific properties. It is believed that every plant requires a specific food, which other families do not stand in need of, and which they do not take up. This is evidenced by the *fact*, that wheat cannot be profitably grown on ordinary land, in two successive years, upon the same field, without a great falling off in the product. And is now laid down as an axiom in good husbandry, that two crops of any small grain should never be taken from the same field in successive years because they draw too largely upon the same specific food. But after an interval of four or five years, in which grass and roots intervene, the specific food of the wheat crop has so accumulated in the soil that this grain may then again profitably be grown upon it. So with all other crops, not even excepting the grasses. The law of nature's change in the products of a soil is so palpable, that in Flanders and Holland, where flax is one of the profitable staples, they do not think of cultivating *this crop upon* the same ground oftener than once in ten or twelve years. Our farmers, some of them, seems to appreciate these truths in reference to tillage crops, without duly reflecting that they apply as well to grass. Meadows, too, deteriorate; in a few years the finer grasses run out because the soil becomes exhausted of the particular food which affords them nourishment, coarse or innutricious plants take their place and the herbage becomes inferior in quality.

Upon an average, old established meadows would yield double their present crops, if judiciously alternated with grain and root crops. The terms "suitably divided into mead-w, plough and pasture lands," which are generally employed to recommend farms for sale, are an indication of bad husbandry; and very often betray the secret which compels the owner to sell. Excepting in very stony districts, every acre of land which would produce good grasses, *may by being rendered dry* and rich, be made to produce good grain and roots. In this convertible system of husbandry, permanent

meadow or plough lands are almost unknown—every field produces in turn crops of grain, grass and roots.

There are three classes of crops which alternate beneficially with each other, viz: 1st, grain, or corn, or dry crops, which mature their seed and most exhaust the fertility of the soil; 2d, grass crops; and 3d, root or green crops, embracing turneps, potatoes, beets, clover, &c. In old meadows and pastures, not only the better grasses disappear, and coarse herbage and mosses come in, but the soil becomes too compact and hard to admit the free extension of the roots, and the genial influence of the sun, dew and atmosphere, which are primary agents in the process of vegetable nutrition. Tillage corrects evils. It cleans the soil of weeds, and converts them into sources of fertility; it breaks and pulverizes the soil, and fits it for the return of the grass crop at the crisis of the rotation; while the vegetable matters of the sward continue to augment the root crop which is to follow. All green crops are more or less fertilizing when buried in the soil, but clover is preferred, as well on account of its enriching properties to the soil, as that it also affords hay and pasture. The practice of sowing clover seed with grain crops is adopted by some farmers every year. Judge Buel followed this plan, but he ploughed his field on the following year. The food which this clover affords to the coming crop, richly compensates for the cost of seed and sowing, to say nothing of the pasture it gives in autumn. Hence tillage is admirably calculated to fit and prepare the ground for grass, and in return directly or indirectly furnishes an abundance of food for grain or roots. The fertility of a soil depends, essentially upon its power to absorb water by cohesive attraction, and this power in a great measure upon the state of division of its parts—the more divided they are, the greater is their absorbent power. The crop upon a hard compact soil will suffer from drought: but if this soil is finely pulverised and broken it will suffer much less. The first may be compared to the rock, which receives moisture upon its surface only, the latter to the sponge, which receives and transmits moisture to the whole mass and which retains it for a long time.

TAINT OR DRY ROT IN THE POTATOE.

From the experience I have had in the cultivation of the Potatoe, I have come to the conclusion that the taint or dry rot owes its origin entirely to an injudicious method of planting the seed; and after mature consideration, I have adopted a system of planting, which I have practised for twenty years with such success, as never once to have had an instance of dry rot among my Potatoe crops during that time, although they were growing sometimes in direct contiguity to other Potatoes, which, from being planted in a different manner, were labouring under the effects of the disease. It shall now be my endeavour, in as simple and concise a manner as possible, to lay this system before my readers, convinced that they will in practice find it a most effectual remedy for the disease in question. The chief cause of this disease I consider to be the prevalent error in planting the Potato, of placing the seed in a quantity of dung laid in the middle of the drill. He who knows anything of the qualities of dung, knows it is of itself incapable of promoting vegetation, or sustaining vegetable life, until decomposed and incorporated with a portion of earthy soil, and it is not therefore to be wondered at that disease and failures in the Potato crops are so prevalent. The wonder is, that, while such a system of planting is persevered in, any of these crops should succeed at all under such treatment; and indeed this is only to be accounted for by the small quantity and inferior quality of the dung applied, which is generally found mixed with great quantities of half-rotten straw and other extraneous substances, such as coal cinders, &c., and were it not that the fresh earth is laid immediately on the top of the dung after the seed is planted, the failure of the crops would be to a much larger extent; of this I have no doubt. The ground, too, if in a very impoverished state, may by speedily digesting and drying up the dung prevent to a great extent a total failure of the crop, although the seed were planted thus injudiciously in the midst of the dung; for it will be observed that in such ground the rot is not so destructive as in rich deep soils. The first and great point, therefore, in setting the Potato, is to have the manure properly commingled with the soil before introducing the seed, the plan I adopt in planting, which is briefly as follows:—

In preparing a parcel of ground for the reception of the Potato seed, I proceed to have the manure spread regularly over the surface, and evenly dug in. I then either drill the ground, after the manner of gardeners in sowing peas, and plant the Potatoes in the drill, or plant them with a dibble, without drilling, about two or three inches beneath the surface, the dibble being formed with a broad point, so as to insure the Potato having no open space left beneath it, when dropped into the hole. For large fields, which cannot well be dug or planted in this manner, I would recommend the ground to be prepared and the dung spread exactly as for Oats or Barley. Then have the ground drilled, and in planting place the seed Potato in the clean soil, on the back of the half drill, formed by the return of the plough, which half drill should be made larger than ordinary, to bring the seed as near to the centre of the drill as possible, so as to afford it every advantage of the fresh soil to vegetate in. In this way the fructifying earth, in which the seed is embedded, will secure its healthful vegetation, and as it progresses in its growth, and so soon as it throws out roots, it will reap the full benefit of the manure contained in the surrounding soil. It is of the utmost importance to have the seed planted, so as it may have the earth both below and above it when put in; for in keeping the seed free from the dung, I apprehend, lies the whole secret, which should be particularly attended to.—*From a work on this subject, by J. Smith.*—Blackie and Sons. Glasgow.

THINGS TO BE AIMED AT ON A FARM.

1. To exhibit a considerable ambition to be esteemed a good farmer, to contribute all that can be done to the stock of human happiness, and which may be undertaken with profit to himself and benefit to the community.

2. To make a compost of one part of stable manure and two parts of earth, or other properly decomposed matter instead of using long munure from the stable, in its green state.

3. To use manure spread and ploughed in, and not to apply it green in the hill—particularly with potatoes; as, by this practice, the crop suffer both in quantity and quality, especially in dry seasons.

4. Where a crop of grain is wanted from land to be laid down in grass, the better plan is to sow grass seed in September, after taking off the grain crop, and ploughing in the stubble. Grass seed should be sown thick, from two to three pecks of timothy and a bushel of red top should be allowed to the acre.

5. All barns should, if possible, be provided with cellars—part for roots and part for manure, and should be made warm and comfortable. This will operate, too, as a saving of food. There should also be water at hand.

6. Improvements should be made on a farm on a good scale, and with liberal outlay, if practicable, instead of laying out surplus funds in buying more land.

7. There should be a systematic course of culture of the land, there should be a plentiful planting of fruits and ornamental trees, and all the small fruits should be in abundance, at least for the useful, insects destroying birds, if not for market.

8. Deep ploughing, good in general, should be resorted to as a remedy for the washing of land on hillsides—it absorbs the water that falls upon the surface.

9. To plant unproductive and waste lands with trees—such as locusts for posts, &c.

10. Not to be alarmed at scientific, or what are more commonly called "book farmers," and "gentlemen farmers;" these are the greatest public benefactors, as their experiments often light upon some thing extremely valuable to the "stand still" farmers, who are often induced by them to move on, and to be improving in their practice.

11. To keep all tools in good order, and in their proper place when done with, and not in the furrow in mid-winter, nor the harrow turned up in a dangerous position against a fence, nor carts and wagons standing out at all times and hoes, shovels, and dung forks scattered here, there, and everywhere.

12. To take one good agricultural and horticultural paper in the country in which they live, first and then, if they want to extend their knowledge beyond that, the best general paper they can hear of at a distance. To do this with a view to a progressive improvement, and to learn what is going on in the way of the best culture, kinds and preparation of manures, good and new seeds, first rate varieties of fruits and vegetables, &c., so as to keep up, to the best of their means, with their neighbours and the world at large.—*Selected.*

From the Farmer's Cabinet.

THINGS THAT I HAVE SEEN.

I have seen a farmer build a house so large and fine that the Sheriff turned him out of doors.

I have seen a young man sell a good ferm, turn merchant, break and die in an insane hospital.

I have seen a farmer travel about so much, that there was nothing at home worth looking after.

I have seen a rich man's son begin where his father left off—wealthy; and end where his father begun—pennyless.

I have seen a worthy farmer's son idle away years of the prime of life in dissipation, and end his career in the poor-house.

I have seen the disobedience of a son "bring down the gray hairs of his father to the grave."

Portable Grist Mill.—Messrs. Sinclair and Co., of Baltimore, have recently got up a grist mill, which is very highly spoken of by a correspondent of the Marlboro (Md.) Gazette. "It can," says the writer, "be worked by *hand* or horse power; with two men, it will grind at least three bushels per hour, and with four horses it will grind more than any water-power mill, with one pair of burrs, in the country. The work is done in a splendid manner. The grain can be either simply chopped, or ground into small hominy, or coarse meal, or made into meal as fine as flour need be. This is done merely by turning a screw. So easily can it be moved, that two men can take it about with as much ease as they can move a corn-sheller or wheat fan. The burrs are of cast Iron, and will grind from three to five hundred bushels before they become too smooth for use, when any farm hand can take them out and replace them with others, which cost $3,50 per pair. There is no other part of the machine that will not last an age. The cost is only $40."—*Albany Cultivator.*

Pigeon Weed or Red Root.—"C. M. A. J." of Tompkins County, says:—

"The plan adopted by the farmers in this section of country, is by plowing in the fall, the usual time of sowing wheat; again in the spring, when the ground can be used for summer crops of any description, and I will guarantee, yea, more, I will stake my reputation upon it, that all that makes its appearance in the fall and spring, will never do so again. This method is considered with us, the most economical and effectual of any yet discovered, of *eradicating the evil. Try it, and you will see.*"

THE GRASSES.

[*Note*—The term grasses is here used only in the popular sense, and includes those plants of the order *Graminiæ* which are not cultivated for grain.]

In no department of American agriculture is there more lack of knowledge, and such wretched practice, as in the cultivation of grasses. Individual farmers, in this country, do not possess the means or ability for conducting such a series of experiments and observations are requisite for obtaining a full and correct knowledge of this important and extensive family of plants. Hence, this branch of our husbandry must remain defective, till suitable institutions are established for that purpose.

In a valuable article on grasses, in the New Genesee Farmer of 1840, Professor Dewey states, that "more than 1,800 species have been decribed by botanists. More than three hundred are ascribed to N. America; and more than two hundred are found in the State of New York." About 150 species are said to be natives of Great Britain; and about 40 kinds are, more or less, cultivated in England, for hay or pasture. In the United States, only five or six kinds are in cultivation at all, and only three or four extensively. In Western New York, thousands of farmers never sow any grass seed except Timothy, (*Phleum pratense.*) This is avowedly the most nutricious and profitable grass for hay; but it is by no means well adapted for all purposes, and to all soils. For Pastures, especially, it should never be used except mixed with other kinds.

The advantages of sowing a mixture of grasses are not sufficiently understood, or appreciated, in this country. It has been found that a square yard of turf will support, at least double the number of plants when comprising several species, that it will of only one species. The reasons for this are, first—the different species subsist on somewhat different elements of the soil; and, secondly, having different kinds of roots, some with tap roots running deep, and others fibrous and superficial, the different species derive ther sustenance from different parts or strata of the soil.

Sir H. Davy and others, observed, that in the best old natural pastures, in England, there is a mixture of from 15 to 20 species of grass; and that some one or more of these have their particular season of luxuriance each month, from spring to latest autumn; or, in other words, different species of grass growing on the same piece of land, supply stock with pasturage in different months of the year. It was also observed, that the mixture was different on different kinds of soil. Hence was seen the necessity of a more definite knowledge of the character and habits of grasses, in order to establish a perfect system of culture; and this was the occasion of the celebrated Worburn experiments, under the patronage of the Duke of Bedford, conducted by G. Sinclair, the particulars of which constitute the admirable standard word on grasses, called "Hortus Gramineus Woburnensis." The experiment and observations of Mr. Sinclair were of ten years' continuance, and embraced more than one hundred species of grasses. Each kinds was cultivated, seperately, on different soils; the time and manner of growth, and the amount and quality of produce, of each kind, carefully noted: and the proportion of nutritive matter, and other elements, ascertained by chemical analysis. These experiments form the basis of the present improved system of manuring grass lands in England, and may aid us, to some extent, in this country; but owing to the difference of soil, climate, and other circumstances, similar experiments will have to be made here. There is no need of waiting for those experiments, however, for enough is already known, of some species, to leave no room for doubt that their introduction and general culture, in this country, would be the means of greatly improving our agriculture.

Orchard Grass, (Dactylis glomerata.)—This grass has been cultivated for many years, in some parts of this country; but is very little known, and cannot be said to be fairly introduced in Western New York. It is not quite equal to timothy, in the nutrive quality of its hay; but it excels that species in other important qualities, especially for pasture. It starts earlier and more rapidly in the spring, continues its growth more uniformly throughout the summer, and affords later pasturage in the fall. All kinds of stock are very fond of it, and it is said that the sheep will pass over every other kinds to feed on it. The late Col. Powel, of Pensylvania, after cultivating this grass for ten years, declared it produced more pasturage than any other grass he had seen in America. Sinclair ranks it among the very first, especially for sheep: and its cultivation in England has greatly increased of late years, it having, with timothy, in a measure superseded rye grass or sowing with clover.

In the transactions of the New York State Agricultural Society, for 1841, a writer from Madison Co., states, that orchard grass is cultivated by some farmers in that county, and produces excellent hay, and abudance of pasturage; starting early in spring, and again after being mown. It also endures drought better, and yields feed later, than any other species; is never killed by the winter, and its roots are easily subdued.

Perennial Rye Grass, (Lolium perenne.)—This grass deserves to be mentioned more on account of its popularity in Great Britain, than for any benefit that is likely to result from its introduction into this country. Professor Low says, this "is one of the most important of the gramineus herbage plants, and is more generally cultivated in Europe than any other." It is valuable for its large produce of hay, and also for pasturage, and is the kind heretofore commonly sown with clover in England and Scotland. It has been frequently tried in this State, by European settlers and others, but not with very good results. The winters are too cold, and the summers too hot and dry for it.

The Indian Rye Grass appears to be an improved variety of the preceding, said to be more productive. In Buel's Farmers' Companion, it is stated, "We have twice tried the Italian rye grass, but the result has induced us to abandon it. This variety give the largest produce: and were it hardy enough to withstand our winter, it would, no doubt, become a valuable acquisition to our husbandry."

Meadow Foxtail Grass, (Alopecurious pratensis.)—This is one of the most highly esteemed of the British grasses, and, if introduced, might prove of great advantage for mixing with other kinds, in laying down permanent meadows both for hay and pasture. Professor Dewey says, "I have not known it cultivated, but small patches of it are found frequently in the meadows of New England, and in this State." Loudon says, "This grass possesses the three great requisites quantity, quality, and earliness in a degree superior to any other. It is often fit for the scythe by the middle of May [in England.] It flowers twice a year, and gives more bulk and weight of hay than any other grass." Dickson says, "Of all the English grasses this appears to be the best adapted for cutting twice." Dawson says, "This is one of the earliest and best pasture grasses, but not so well adapted for hay, as it produces but few stalks, which are but sparingly furnished with leaves; its root leaves are very broad, long, soft, slender, and grow rapidly when cut or eaten down by live stock; it grows, naturally, on rather superior soils of medium texture, and constitutes the greater portion of many of the richer natural pastures in Britain. It requires two or three years, after sowing, to arrive at full maturity."

Meadow Fescue Grass, (Festuca pratensis.) is another British species, eminently deserving of introduction for permanent grass lands, nearly or quite equal to the preceding for earliness, productiveness, and quality. It is occasionally found in old fields and meadows in this State. Low says, "this is justly ranked among the superior grasses. Although large, it is not a coarse plant, and does not, like some of the other large kinds, form tufts in growing." Loudon—"It is highly grateful to every description of stock; and is more in demand for laying down meadows than any other species except the rye grass."

Tall Fescue, (Festuca elatior.)—This is claimed as an American species, but does not appear to be indigenous to this State, although frequently found in old meadows and cultivated fields. It is of much larger growth than the preceding; yields an abundant crop, and although of coarse appearance, it is relished by cattle generally. It seems to delight in moist, rich soils, along river banks, &c. The writer is not aware of any experiments having been made with its cultivation in this country; but it seems well adapted for moist rich lands, and is certainly deserving of trial. According to Sinclair's experiments, this species stands the highest of all in the quantity of nutritive matter, when cut at the time of flowering; and our timothy grass when cut at the time the seed is ripe. Several other species of *festuca*, both British and American, are deserving of cultivation, mixed with others species.

Tall Oats Grass, (Avena elatior.)—This grass has been highly recommended for introduction, and promises to be of much value in this country. It is of rapid growth, and very productive of hay, though, according to Sinclair, the hay is not very nutritive. Buel says, "It possesses the advantage of early, late, and quick growth, and is well calculated for a pasture grass. We have measured it in June, when in blossom (at which time it should be cut for hay) and found the seed stems four and a half feet high." Lawson observes, "This grass is cultivated to a greater extent in France than any other kind whatever. It has not been fairly tried in British husbandry, but, judging from the experiments that have been made, it seems well deserving of more extended cultivation." Colman, in his Fourth Report, says, that this grass is cultivated and much esteemed in Middlesex Co., Massachusetts.

Sweet scented Vernal Grass, (Anthoxanthum odoratum.)—This is a British grass, of a small growth, but valuable for pastures, especially for sheep, on account of its very early growth. It is esteemed for parks and lawns, in England, on account of the fragrance of its flowers; and it is this which gives the fine fragrance to English meadows and hay fields. It is seen occasionlly in old pastures in this State, and according to Fessenden, it constitutes a large portion of the crop in some meadows in Massachusetts. He observes, "Its chief fault is, that it is too early for other grasses, [for hay:] but it affords a second, and even a third crop, if cut early. It is this that gives the fine flavor so grateful to milch cows."—(*Complete Farmer.*)

Blue Grass, (Poa compressa.)—The Blue Grass of this and other eastern States, is a native species, found in old pastures, and by road sides, especially in land somewhat worn out. It forms a dense turf, like its sister species *P. Pratense*, or June grass: and, like it, yields but little produce, and that of such inferior quality, that cattle eat it with reluctance. It is distinguished from June grass by the peculiar bluish color of the stems and flowers. The roots are very tenacious of life, and difficult to eradicate, consequently it is deemed by farmers an unwelcome intruder.

The Blue Grass of Kentucky and other southern States, has, by some botanists, been regarded as indentical with that of the north, and by others as the June grass, [*Poa pratense.*] but from the accounts that have been given of it in the papers, it is a much more valuable species than either of them, and, if found to be sufficiently hardy, it may be advantageously introduced into the middle and eastern States.

Other Southern Grasses have been frequently noticed in agricultural publications of late, and some of them are described as being highly valuable—such as Gama Grass, Bermuda Grass, Buffalo Grass, &c.; but such as have been tested are not able to bear the winters of this State, and it is not probable that the other will be found of value, except for more southern climates.

(A complete treatise on the grasses, indigenous and cultivated, would be of great value.

CLOVER, TREFOIL, &c.

Next in importance is the clover family; and here again we find several plants, promising great utility, that are almost, or entirely unknown in American agriculture. Some of these may be of general advantage; but a large number are adapted to particular purposes, or peculiar soils, and to the older parts of the country, where lands are high in price, and worn or poor in quality. Two species of red clover, and one of white, are all that are commonly cultivated in this country. A few other kinds will be briefly mentioned.

Alsike, or Hybrid Clover. (Trifolium hybridum.)—This is a new species of clover, a few of which were obtained by the writer from Mr. Lawson, at the Agricultural Museum, Edinburgh, in the fall of 1839. Mr. Lawson states, that it was introduced from Sweden, in 1834: and "from what he saw of the *T. hybridum*, it seems to be a valuable perennial clover, and well adapted to growing in this country, [Scotland;] but hitherto seeds have not been obtained in sufficient quantity to give it a fair trial in field culture."

Some of these seeds were given to David Thomas, of Cayuga, and to William Garbutt, of Monroe, at both of which places it has grown freely, although their soils are rather too heavy. In appearance this clover is intermediate between the red and the white. The flowers are white, with a tinge of red: the leaves resemble the white but are somewhat larger; the stem is about as tall as the red, and more inclined to take root and spread like white clover, the roots are more fibrous, and more perennial or durable than the red—hence it will doubtless be found a valuable acquisiton for pastures, as soon as the seeds are to be had in sufficient quantity.

Crimson or Scarlet Clover, or Trefoil, [Trifolium incarnatum]—This species was recommended, in the agricultural papers of this country, a few years ago, and small quantities of the seed were sold at the Rochester Seed Store, and elsewhere; but it does not appear to have been cultivated to any considerable extent. It is found to grow freely under favorable circumstances, when sown in the spring; but the writer is not aware whether any experiments were made by sowing in the fall, as practiced in Europe. It is annual clover, and is recommended for sowing in the autumn, to produce a crop of hay the succeeding summer, where land is intended for wheat. It is doubtful whether this species will prove of much value in this country, but it is deserving of experiment.

Bokhara, or Giant Clover, [Melilotus leucanthus.]—In 1841, an ingenous Yorkshireman contrived to produce two or three plants, of the common sweet clover, of the flower gardens 10 or 12 feet high; and on exhibiting them at an agricultural show, he was awarded a premium for a "new and gigantic species of clover," which was soon heralded in the papers both of England and this country, and quite a lucrative trade was shortly commenced in the seeds. The humbug exploded the following year, very little has since been heard of the "Bokhara Clover." In the Cultivator for November, 1842, James Gowan, Esq., of Philadelphia, expresses an opinion that this plant may be found valuable for soiling cattle, and his determination to give it a trial, notwithstanding it is not so new and wonderful a vegetable as was once supposed.

It is a biennial plant, of a tall and rapid growth, (not properly a clover,) and not much relished by cattle, except when young.

LUCERN, or FRENCH CLOVER—

(Medicago sativa.)

No plant has been more frequently or more strongly commended to the attention of American farmers, during the past twenty years, then Lucern; yet it has never been fairly tried, except in a very few places, although it is found to be well adapted to the climate and soil of most parts of the United States, and of great productiveness and value.

The best soil for lucern is a deep sandy loam, free from wet, and having an open subsoil. Inattention to the kind of soil has been the cause of the failure of numerous experiments with this plant, in Western New York and elsewhere, and these frequent failures have tended to prevent its more general introduction. Another difficulty in the way, and a very serious one with some farmers, is, the land must be very free from weeds, or the crop kept clean by hoeing or weeding, the first year. But, after all, the main reason why this and many other valuable crops are so slowly introduced, is the strong aversion, in the minds of the farmers, to stepping out of the beaten track, or attempting the cultivation of any plant which they have not seen their father cultivate before them.

This is well illustrated by a writer in the Annapolis Republican, in speaking of a patch of Lucern on the farm of Wm. Johnson, Esq., of Somerset Co, Maryland. He says, "It consists of about three quarters of an acre; was sown in 1829, and has been cut—this makes the twelfth year. He keeps two horses and three cows; has a full supply of milk and cream, and more butter than he knows what to do with—much more than can be said of many farmers who have five hundred acres of land, without a lot of lucern. This lot has been cut once over this season; and now before he can get half over again, the horses and cows getting more than they can devour, he will have to make hay of it, to prevent it from getting too old. It comes several weeks before clover—may be cut four or five times—strikes its root very deep, and therefore will stand dry weather and will last, no one knows how long, for this is now a splendid crop, after being cut eleven years; and yet farmers won't sow it!—even Mr. Johnson's neighbours, with a few exceptions, and with his success staring them in the face! I told him, they say they cannot get it started—that the weeds and grass will smother it the first year. 'The way to manage it,' said he 'is this:—Take a rich lot of ground, on which the water does not lie winter nor summer; cultivate it previously in potatoes; sow your lucern broadcast, the 1st of May, 20 lbs. of seed to the acre, and in July cut it. You may suppose, from the looks of it the first season, that the weeds and grass would overcome it; but don't be alarmed. They die off, and the second year the lucern will survive, almost in immortal vigor.'

"Lucern possesses the remarkable characteristic of being exempt from that quality in clover, and other green meat, (as the English writers call it,) which makes them dangerous to give to horses when in active exercise. In other words you may feed them as Mr. Johnson does his carriage horses, on lucern instead of dry fodder, or hay, and travel them on it fast or slow, without danger of touching their wind. Every one knows, that this can't be done with clover. But what signify a thousand arguments and illustrations? This, like others, will be read and thrown aside, as a thing that 'tells very well on paper,' but too troublesome to be put in practise!"

Experiments with lucern were commenced in this state, as long ago as 1793 and 1794, by Chancellor Livingston, and one or two others, who published the results of their experiments, and advises its cultivation. Judge Buel, in the Cultivator of 1837, says, "We have had considerable experience in raising lucern during the last 16 years. Until recently, we have found it an invaluable crop, having been enabled to feed six or seven cattle upon an acre of it during the winter months; but for two or three of the last years our efforts to cultivate it have been less successful, on account of the severity of the winters, which has destroyed many of the plants; and the intrusion of other grasses, particularly of spear-grass." The late John Lowell, of Roxbury, Mass., cultivated lucern for more than 20 years, and warmly advocated its general cultivation. In a letter to the Editor of the New England Farmer, in 1838, he says, "The lucern will give, in this State, two good crops the same season in which it is sown. Is there any other grass that will do this? It will endure the severest droughts, when all other grasses fail. It is the favorite grass of the horse and the cow. It will do as much for a horse as an ample supply of grass and four quarts of grain a-day, in keeping him in flesh and strength. But many persons have failed in attempts to raise it. And what then? Does it follow that it is not worthy of culture. By no means. If *one* man uniformly succeeds for fifteen years, there must be some good reason why others *do not* succeed. Let us try to seek out the causes of their ill success. It is not the climate, because it stands our severest winter unhurt, when clover *fails*. It stands our severe droughts, when clover dies.

'It is with me the richest treasure. My farm is small, it is true; but it is a grazing farm, and my produce is 20 tons of hay. Surely the experience of such a farmer, for 15 years, is worth something. I have already cut two crops this season from lucern, sown in April last; and two crops from lucern two years old, and two crops of hay from lucern three years old, at the rate of 3 tons to the acre. I expected two crops more from each. These are facts notorious to them who pass by my ground."

Mr Joshua Leader, in the Farmers' Cabinet for 1842, observes on this subject, "No crop can at all compare with lucern, for quantity or quality, whether as green food for soiling, or as hay, of the most nutritious and fattening qualities. It is a grand mistake to suppose that a very rich soil is necessary for its growth or well-being; it is rather otherwise, the only *sine qua non* being a very dry subsoil and light surface: upon such a soil the necessary means of support can be given by top dressings of well composted manure, the chief regard being, that it contain no weeds. It is to be remarked, that hogs pastured on this grass require no other food, being often slaughtered, in fine condition, while feeding on that alone. The culture by drilling is not to be recommended; sow the seed thickly on a clean and well pulverized soil, either in the spring, the summer, or the autumn, without any other crop; the plants will appear in a few days, and, if they are not choked with weeds, will soon overspread the land. An early and frequent cutting, giving them a fresh start over the weeds, and a slight harrowing, after every cutting, will enable them to keep it. Truly, it is strange that such an invaluable crop is still confined to patches 'the third of an acre.'"

SAIN-FOIN, or SAINT FOIN.

(Onobrychis sativer.)

This is another British herbage plant, that has frequently been recommended, and occasionally tried, in this country, but without seeming to gain much favor, or promise much advantage. In England it is extensively cultivated on dry, chalky soils, for 'which it seems peculiary adapted. Sir John Sinclair observes, "that the improvement made by sain-foin is very great. Poor soils, not worth more than from 2s. 6d. to 5s. for any other purpose, will under this crop, yield from 1½ to 2½ tons of valuable hay, worth a guinea per ton more than meadow hay equally well cured, besides a considerable quantity of after-grass. It also lasts in the ground equally productive for a number of years."

The Editor of the American Farmer, (April, 1842) recommends sain-foin for cultivation on poor and worn-out lands at the South, with the application of lime and calcareous marl for dressing. It is not at all improbable that for such purposes it may be found valuable. Also on some of the high limestone soils of this State and Pennsylvania, where clover will not succeed. Fessenden says, "The cultivation of sain foin is out of the question in New England, so large a portion of the plants being winter-killed, that it is not worth cultivating." This is affirmed on the strength of repeated trials."

Smut in Wheat.—The following remedy for smut in wheat is communicated by Mr. Thedam of Little Braxton, Essex:—

Dissolve 5 lbs. of blue vitrol (sulphate of copper—it is worth about 5d. per lb.) in five gallons of boiling water; then add the solution to 30 gallons of soft water: place the whole in a tub: dip the seed wheat, in a basket, into the solution for one minute: drain; turn the seed upon the floor. It will be ready for immediate use except for the drill, for which it will be dry enough in twelve hours. This has been found an unfailing remedy after nine years' trial. No lime is needed. Neither the bags nor the drill are injured.

TORONTO HORTICULTURAL SOCIETY.

The Second Exhibition of the Toronto Horticultural Society came off, agreeably to a former announcement of ours, on the 17th ultimo, at the grounds of the Government House. It was by far the most creditable performance of the kind that has ever taken place in Canada; and we are informed, has given general satisfaction to all who favoured the Society with their presence. Indeed, the great display of fruits, flowers, and vegetables that were exhibited both by professional gardeners and amateurs has been the principal topic of conversation for several days subsequent to the Exhibition. If any one performance gives evidence of a highly-cultivated taste, it is that of the inhabitants of our towns and cities engaged in a praiseworthy emulation of each other in the production of the choicest ornamental and useful fruits of the season. This can best be accomplished through the agency of organized Societies, and magazines devoted partly or exclusively to the science and practice of Gardening.

The citizens of Toronto are under high obligation to the President and founder of this creditable Institution, W. B. Jarvis, Esq., who has so indefatigably devoted his time, talents, and influence in its behalf. As the Institution is established upon a sound basis, and the gardeners, without an exception, exhibit a lively interest in its success, the citizens would show evidence of their good sense if they would come forward and sustain it with their purse and influence.

We are requested to state, that, if the funds will admit of the arrangement, there will be an autumnal Exhibition, about the middle of next September. This, however, will depend altogether upon the citizens themselves. We hope an effort will be made to raise the necessary funds for the intended September Exhibition.

THRASHING MACHINES.

Those of our readers who are desirous of procuring a stationary two-horse power thrashing machine would do well to consult the machine makers of this District, who has built a machine constructed after an American pattern, and which is very justly admired by all the best farmers in the Home District. A large portion of our farmers have one attached to each of their barns, the cost being only about eighteen pounds for the entire machine. They require but a trifling amount of skill or expense to be kept in good repair, and they will properly thrash from one hundred to one hundred and fifty bushels of good wheat in a day, of ten hours, by proper attendance. They are manufactured by Mr. Absalom Blaker, in the village of New Market; Mr. Josiah Jones, in the immediate neighbourhood of the village; Mr. Edward Caldwell, Whitby, and by numerous other machine makers in various parts of the District. They have been in use in the District for about nine years, and the demand has gradually increased, so that it may now be safely said that there are some hundreds of them in use.

(Continued from the July Number.)

AN EASY METHOD OF MANAGING BEES, IN THE MOST PROFITABLE MANNER TO THEIR OWNER.

General Observations.

The reader might have expected many things demonstrated in this work, which are omitted by design.

The structure of the worker is too well understood by every owner of bees to need a particular description. So also of the drone; and the Queen has already been sufficiently described to enable any one to select her out from among her subjects. If any further description is desired, the observer can easily satisfy himself by the use of a *microscope*. Every swarm of bees is composed of three classes or sorts, to wit: one Queen or female, drones or males, and neuters or workers. The Queen is the only female in the hive, and lays all the eggs from which all the young bees are raised to replenish their colony. She possesses no authority over them, other than that of influence, which is derived from the fact that she is the mother of all the bees, and they, being endowed with instinctive knowledge of the fact that they are wholly dependent on her to propagate their species, treat her with the greatest kindness, tenderness and reverence, and manifest at all times the most sincere attachment to her by feeding and guarding her from all danger.

The government of a hive is nearer republican than any other, because it is administered in exact accordance with their nature. It is their peculiar natural instinct, which prompts them in all their actions. The Queen has no more to do with the government of the hive than the other bees, unless influence may be called government. It is found by experiment that bees will go to work, and continue their labors with perfect regularity, with a dead Queen, as long as she is confined in the hive in such a manner that the bees will keep her in motion; but as she is the only female in the hive, no eggs will be laid, no brood comb made, and no young bees raised: notwithstanding there is a plenty of drones, as there are no grubs (larva) in the hive to consume the pollen, the combs will be unusually loaded with bread; and the bees will finally perish by the depredations of the moths, or want of animal heat in the winter, which is generated in the hive by a populous community only. If any one is disposed to doubt on this subject, let the experiment be tried with *skill*, and I will be answerable for the result, to wit: Take the Queen from a first swarm (second swarms frequently have more than one Queen,) kill her, and by means of a fine wire, or strong string, suspend her in the hive; now let in the swarm; confine the bees in the hive until they have found their sovereign, and clustered about her, then give the bees liberty to work. If the experiment ends here, entire loss will be the final result. Bees have so many admirers, they will soon dwindle away in numbers, and perish in consequence of losing so many of their companions, which are caught by the birds, and are lost by other casualties, unless they have the means of propagating their species. But there is a remedy by which the bees may be supplied with a Queen, which is more simple, though more difficult than the ordinary method. Take brood comb containing eggs and larva of workers only, from any hive that contains them; place the same in a drawer in its natural position; now insert this drawer into the chamber of the hive, so that the bees can have access to them and they will have a Queen in a few days. If she finds empty cells in the hive, during the breeding season, she will deposit eggs there, because it is her nature to do so; and the nature of the workers prompts them to take care and nurse all the young *larva*, labor and collect food for their sustenance, guard and protect their habitations, and do and perform all things in due obedience, not to the commands of the Queen, but to their own peculiar instinct.

The drone is probably the male bee, notwithstanding the sexual union was never witnessed by any man; yet so many experiments have been tried, and observations made, that but little doubt can be entertained of its truth. That the sexual intercourse takes place high in the air, is highly probable from the fact that I have seen an attempt at copulation by the drone with the Queen on their return from an excursion in the air, before she could enter the hive, and other insects of the fly tribe do copulate in the air, when on the wing, as I have repeatedly seen. That the drone is the male bee, is probable from the fact that the drones are not all killed at once, but at least one in each hive is permitted to live several months after the general massacre.

I examined four swarms, whose colonies were strong and numerous, three months after the general massacre of the drones, and in three hives I found one drone each; the other was probably overlooked, as the bees were thrown into the fire as fast as they were examined. But there are many mysterious things concerning them, and much might be written to little purpose; and as it is designed to go no further in illustrations than is necessary to aid the apiarian in good management, many little speculations have been entirely omitted in the work, and the reader is referred to the writings of Thatcher, Bonner, and Huber, who are the most voluminous and extensive writers on bees within my knowledge.

The importance of taking the Queens from all small, and late swarms, and returning them to the original stock, cannot be too much insisted upon. It constitutes a very important feature in my system of managing bees. Even first swarms that are late, had better be compelled to remain in the parent hive. The prosperity of a hive of bees depends in a great degree upon their number being kept full. They are their own best defenders. Their number not only protects them from the depredations of the moth and the robberies of other swarms stronger but the animal heat which is generated in the hive by a populous community protects the combs from molding, and the bees from freezing in the coldest weather. But the apiarian derives another advantage by keeping his hives full of bees; he secures a larger quantity of honey from a full swarm, than from many small ones. The time for making much honey does not usually last more than 20 or 30 days in Vermont, and the greatest proportion of honey that is deposited in the hive for winter use is collected in fifteen or twenty days. This renders it very important that the attention of the old stock should not be called off from gathering honey at this time, to guard their hive from the attacks of moths to which it is left exposed, by the desertion of that part of their body which has accompanied the Queen to constitute a new swarm. Hives that are well stocked with bees in the spring, swarm much earlier than feeble ones, and are able to use the best of the season to great advantage.

In speaking of the advantages of a large colony, I would not be understood to approve of the plan of those persons who so far depart from the economy of nature as to raise bees in a chamber

or in any way where their colonies will much exceed fifteen or sixteen quarts of bees.

Bees are creatures of habit, and the exercise of caution in managing them is required. A stock of bees should be placed where they are to stand through the season before they form habits of location, which will take place soon after they commence their labors in the spring. They learn their home by the objects surrounding them in the immediate vicinity of the hive. Moving them, (unless they are carried beyond their knowledge,) is often fatal to them. The old bees forget their new location, and on their return, when collecting stores, they haze about where they formerly stood, and perish. I have known some fine stocks ruined by moving them six feet, and from that to a mile and a half. It is best to move them before swarming than afterwards. The old bees only will be lost. As the young ones are constantly hatching, their habits will be formed at the new stand, and the combs will not be as likely to become vacated, so as to afford opportunity to the moths to occupy any part of their ground.

Swarms, when first hived, may be moved at pleasure without loss of bees, admitting they are all in the hive; their habits will be formed in exact proportion to their labors. The first bee that empties his sack and goes forth in search of food, is the one whose habits are first established. I have observed many bees to cluster near the place where the hive stood, but a few hours after hiving, and perish. Now if the swarm had been placed in the apiary, immediately after they were hived, the number of bees found there would have been less.

Bees may be moved at pleasure at any season of the year, if they are carried several miles, so as to be beyond their knowledge of country. They may be carried long journeys by traveling nights only, and affording them opportunity to labor and collect food in the day time.

The importance of this part of bee management is the only apology I can make for dwelling so long on this point. I have known many to suffer serious losses in consequance of moving their bees after they were well settled in their labors.

Bees should never be irritated, under any pretence whatever. They should be treated with attention and kindness. They should be kept undisturbed by cattle and all other annoyances, so that they may be approached at any time with safety.

An apiary should be so situated, that swarming may be observed, and at the same time where the bees can obtain food easily, and in the greatest abundance. A bee house should be so constructed as to secure the hives perfectly from the rays of the sun, and weather. All the light the bees can have about the hive is necessary, to induce them to swarm early in the season and a plenty of good air (*not air exhausted of its vitality,*) is absolutely necessary to promote their health, prevent them from acquiring habits of indolence, and hostile feelings, at the same time, a strong current of air, in the immediate region of the hive, near the entrance, where the bees alight, must be avoided: otherwise, when the bees slack up their speed, to alight, the wind will blow them so far from the hive, that many of them fall, and perish.

Much depends on the construction of the house, as well as the hive. It has been a general practice to front bee houses either to the east or south. This doctrine should be exploded with all other whims. Apiaries should be so situated as to be convenient to their owner, as much as any other buildings. I have them front towards all the cardinal points, but can distinguished no *difference in their prosperity.*

Young swarms should be scattered as much as convenient during the summer season, at least eight feet apart. If they are not housed, they should be set in a frame, and so covered as to exclude the sun and weather from the hive. As a general rule, bees flourish better in vallies than on high hills contiguous to them, on account *of bearing their burthens home with greater ease,* descending, than ascending, with a heavy load.

It is not surprising that this branch of rural economy, in consequence of the depredations of the moth, *is so much neglected.* Notwithstanding, in some parts of our country, the business of managing bees has been entirely abandoned for years I am confident they may be cultivated in such a manner as to render them more profitable to their owners than any branch of agriculture, in proportion to the capital necessary to be invested in their stock. They are not taxable property, neither does it require a large land investment, nor fences; neither does it require the owner to labor through the summer to support them through the winter. Care is, indeed, necessary; but a child, or *superannuated person can perform most of the* duties of an apiarian. The cob webs must be kept away from the immediate vicinity of the hive, and all other annoyances removed.

The *management of bees is a delightful em*ployment, and may be pursued with the best success in cities and villages, as well as towns and country. It is a source of great amusement, as well as comfort and profit. They collect honey and bread *from* most kinds of forest trees, as well as garden flowers, orchards, forests, and fields;—all contribute to their wants, and their owner is gratified with a taste of the whole. Sweet mignonette cannot be too highly recommended. This plant is easily cultivated by drills in the garden, and is one of finest and richest flowers in the world from which the honey-bee can extract its food.

The Vermont Hive is the only one I can use to much advantage or profit. In the summer of 1834, I received in swarms and extra honey from my best stock, thirty dollars: and from my poorest, fifteen dollars. My early swarms afforded extra honey which was sold, amounting to from five to ten dollars each hive: and all my *large swarms which were doubled, stored a sufficient* quantity of food to supply them through the following winter.

The rules in the foregoing work, perhaps, may be *deemed, in some instances, too particular;* yet, in all cases, they will be found to be safe and unfailing in their application, though liable to exceptions, such as are incident to all specific rules.

Every bee-owner should be able to answer the following questions in the affirmative, if he wishes to make his bees profitable:—

Have you weighed and marked the weight on all your hives before using them?

Have you scratched the under side of the chamber floor?

Did you secure the hive from the rays of the sun at the time of hiving the bees?

Did you let the bees into the drawers at the *time of hiving all your large swarms?*

Did you close the hive, and move it as directed?

Have you let down the bottom board, and turned the drawers as directed?

Have you removed your honey before buckwheat is in bloosom?

Have you taken the Queens from all your late swarms?

Have you turned your drawers so as to prevent the breath of the bees from entering them in September?

Have you fed your destitute stocks in October?

Have you weighed your stock hives, and is there at least 25 lbs. in addition to the weight of the hive on the first of December?

Have you been particular to see that all your hives are properly ventilated, and the bees kept lively during cold weather?

Have you turned the drawers to all your stock hives, so that the bees can enter them as soon as blossoms are seen in the spring?

Have you visited your bees, and examined their true condition, two or three times in each week, through the whole year?

Appendix.

The Hiver is made of three rough boards, half inch thick, seven inches wide, eighteen inches long, nailed together like a common trough, open at both ends—a strap of iron rivited on its outside; across the centre of each board, with a shank or socket to insert a rod to handle it with, so that when inverted by means of the rod, and placed over the bees when alighting, forms a kind of half hive, which they readily enter. There should be from a dozen to twenty half-inch holes bored through the top board, so as to let the alighting bees enter through the holes. When a small portion of the bees are found in the hiver, it may be moved a few feet from the limb, which may be shaken with another rod with a hook on its end, which disengages the bees, and in a few moments the whole swarm will be found in the hiver. By the addition of ferules and joints, the hiver may be raised to any reasonable height. Thus the labor of climbing, the use of ladders, and cutting the limbs of precious fruit trees is entirely dispensed with. It likewise enables the apiarian in large establishments to divide out and keep separate his swarms, which might otherwise alight many in one body.

But another method of collecting and hiving swarms, is recommended by some good bee-mangers, which is of prime importance when the experiment succeeds. It is this:—

Take any common rough board, fourteen inches or more in width, twelve feet or more in length, let one end of the board rest on the hive that is to swarm—say half the distance from the mouth or common entrance to the top—the other end on the ground. When swarming takes *place, the bees will usually be found clustered in* a body on the under side of the board, not far from the old stock. Any one will know how to turn the board over, and place an empty hive over the bees. *Bees, when swarming* in this way, will be less likely to be seen, and therefore may flee to the woods, unless assiduously watched. The hive should likewise be secured from the rays of the sun.

Manure of Fowls.—We regret to see so little attention paid to the saving of pigeon and hen dung. The manure of any kind of birds is extremely valuable for growing melons, or indeed, vine-crops of any kind. Cucumbers, squashes, pumkins, and *especially* melons, grown with hen or pigeon dung are said to be sweeter and more delicate than those from any other manure whatever.—*American Agriculturist.*

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