THE

SOUTHERN PLANTER,

DEVOTED TO

Agriculture, Horticulture, and the Household Arts.

Agriculture is the nursing mother of the Arts.—XENOPHON.
Tillage and Pasturage are the two breasts of the State.—SULLY.

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VOL. XXI. RICHMOND, VA., MAY, 1861. No. 5.

For the Southern Planter.

Grazing Cattle.

Most persons are, doubtless, inclined to the opinion that but little skill is required to fatten cattle upon grass; the only thing supposed to be necessary to this end, being to turn the animals into the fields and let them attain to a state of obesity at their leisure.

But when it is remembered that some farmers invariably have their cattle in high condition and thoroughly fat at market day, whilst others as constantly present theirs in that twilight state of dubiety, between "stock and beef," known as "half fat," there would seem to be something more requisite than simply giving the herd the range of the pastures.

In order to successful and profitable grazing, it is important that the stock should have been well wintered. When "gentle Spring" comes with its "deep green earth" it should find them in a healthy and vigorous condition, ready to improve, as well as enjoy, the luxury of being "turned out to grass." Animals which have been kept during the winter upon an insufficient allowance of provender, and are by Spring so reduced in flesh and exhausted in strength, that the vital organs scarcely perform their appropriate functions, require much time to attain the point, at which their more fortunate brethren, who have fared bountifully, if not "sumptuously every day," would commence that luxurious career, whose end is the shambles. Stock in good condition in the Fall, are much more easily wintered than those commencing that season of trial to the whole bovine race, as rivals to their "ill-favored" cousins seen by the dreaming monarch of Egypt upon the rich banks of the Nile. But I am straying from my subject. It being no part of my intention to discourse, either upon the principles that should govern the buyer, or the best mode of wintering cattle purchased.

As the grasses constitute the natural and appropriate food of cattle, and is that upon which they thrive most rapidly, in order that they may derive the greatest advantage and highest enjoyment from it during the season, they should be turned into the pastures as early in the Spring as the condition of vegetation will permit; which is just as soon as the grass has attained such growth as to enable the animal to crop it readily. I have known cattle lose more flesh by being confined to the barn-yard in the month of April, than they had done during the entire Winter. And this loss of flesh sustained by them, was not compensated for to the owner by the increased growth of the grass.

When stock are turned upon the pastures, whilst the grass is yet young, it springs up so rapidly after being cropped, that they not only have their food during most of the Summer, in the fresh, sweet and nutritious condition of early Spring, but the land actually yields a larger amount than it would otherwise do; for if everything is excluded from the pastures until the grass gets a "good start," that is, until it has attained considerable size and age, it not only grows up much more slowly after being eaten off, but is less acceptable to the animals. It is well known to every observant farmer that those spots where the grass is tallest and most luxuriant, are just those rejected by the discriminating palate of the fastidious quadruped, whilst the short and less flourishing are re-cropped daily with unalloyed appetite.

It is the practice of some successful graziers to winter their stock in the fields upon which they are to be grazed the next Summer, never removing them even for a day, in order to let the grass get ahead. This method is practicable when the farmer has a large quantity of close and heavy "old sod."

I am well satisfied that the same area of pasture-land will make more beef in a season, by turning the cattle upon it early in the Spring, than by the opposite method.

When cattle are turned to grass they should at once be given the entire range of pastures intended for them. To be changing them from field to field during the Summer, induces a discontented and unquiet disposition, in the highest degree unfavorable to the regular and rapid improvement in their condition. So essential is it to the fattening process, that the animal should be permitted to enjoy, in undisturbed repose, the calm pleasures of rumination; the farmer should be careful, as far as practicable, to remove every cause tending to disturb and agitate his herd. Colts and idle horses should therefore never be allowed to run with the fattening cattle.

During the Summer, stock should be salted regularly and abundantly. At this season they seem to require more than at any other period of the year. It would, perhaps, be the best plan to keep a supply constantly by them, but, as this is rarely practicable, it ought to be given to them frequently and at regular intervals. It is my practice to salt each alternate day in the Summer. Under this practice, cattle consume but a small quantity at a time, and it has the effect of promoting their quiet and contentment. The time of the day at which eat-

tle are salted is, I think, a matter of little consequence, although some persons attach importance to it. But as cattle are very regular and methodical in their habits whilst grazing, passing over the entire enclosure allotted to them, in nearly the same order every day, it is well to salt always at the same place, and so arrange the time as to reach the spot simultaneously with the cattle in the progress of their regular rounds.

I much prefer an abundant supply of running water in the pastures, yet those farmers who have to depend upon ponds, insist that cattle do just as well when compelled to allay their thirst from a green, slimy and filthy pool, as when drinking from the coolest spring or most sparkling brook. This comfortable faith in the virtues of stagnant water, I have no disposition to unsettle.

There is nothing more grateful to the panting herd on a hot and sultry day in July, than the cool and refreshing shade thrown over the parched earth, by the wide spread and leaf covered branches of a noble oak or beautiful ash; no humane farmer, therefore, who entertains a just regard for the comfort of his horned dependants, or who recognises the golden rule of "doing unto cattle as you would have them do unto you," will fail to preserve an ample supply of shade trees in his pasture grounds. Anything that adds to the comfort, likewise promotes the thrift of the animals, so that the pecuniary interests of the farmer combine with the voice of humanity and good taste, in demanding the preservation of shade trees.

The number of cattle that can be profitably grazed upon a given area of land depends upon such a variety of circumstances, that it is impossible to give any precise and definite rule in reference to that subject. The farmer, however, ought to be careful not to overstock his lands, if he wishes to enjoy the pleasure of seeing his cattle in a condition creditable to his care and skill as a grazier. Pastures of such long standing as to have formed a close, compact, and heavy sod, of the indigenous grasses, will fatten a larger number of cattle than the same extent of similar lands recently laid down in grass. The size of the cattle is likewise another consideration to be taken into the account; as the same fields will pasture well a greater number of small cattle than of large ones.

The excellence of "old sod" for the purpose of grazing is due rather, I am inclined to think, to the greater quantity and better condition of the grass it furnishes, than to any intrinsic superiority in its nutritive qualities over similar grasses recently set. Upon rich land, which has long remained undisturbed by the plough, the artificial will, in a great measure, have given place to the natural grasses, and these rarely attain such size and rankness of growth as to render them distasteful to the cattle. Again owing to the number and vigor of the roots of these indigenous grasses, they are able daily to furnish a fresh supply of food, however closely they may be grazed.

The relative fattening qualities of different pastures, however, seem to depend more upon the character of the soil upon which they grow, than upon the kind of grasses composing them or their age. In this county, the best grazing farms are

composed of what is popularly denominated Slate lands. They are a heavy clay loam, generally underlaid by a stratum of soap-stone. Of course the richer these lands are, the greater number of animals will they sustain to a given area; yet the nutritive qualities of the grass they yield, seem to be independent of the fertility of the soil. I know some lands of this class, which are by no means rich, yet they fatten cattle admirably.

As this article is intended to be suggestive rather than exhaustive of the subject, I shall trespass no farther upon your columns or the patience of your readers. T.

Augusta County, April.

For the Southern Planter.

Manures.

There are so many manures now being used, without proper discrimination, by many of the Farmers of Virginia,—with detriment, often, both to the land and the pocket—that it appears to me, if any suggestion can be thrown out that may serve to arrest the tide of extravagant expenditures for the many "nostrums" which are now being vended to an unsuspecting community, it will be an act of true beneficence, and prove a profitable service to the agriculture of the country.

In presenting some reflections on the subject, I shall dwell only upon such manures as are known by actual experiment to contribute to the fertility of the soil.

The first and great improver—the basis of all permanent improvement—is *lime or other calcareous earth.* These have been attended with the most satisfactory results in every instance in which they have been judiciously applied. These results have varied only with the variations in the condition of the soil. Upon light lands the action of calcarious matter has been much quicker than upon stiff clay soils; yet, upon both, beneficial results have been certain to appear. It is generally regarded as a most essential element in the improvement of worn-out lands, since, without it, in some form or other, all attempts to resuscitate them have been fruitless. So powerfully has it acted upon acid soils—i. e., soils abounding in sorrel and other acid grasses—that the effects of its application can generally be traced even in the first crop. Upon soils which are close and compact, its mechanical operation has been to make them much more pulverable, and render their cultivation easier and more agreeable. It is a cheap and ready agent, not only for renovating our *worn-out* soils and *barren* hills, but of improving, still further, lands which are considered already in a comparatively good condition. It tends, as has been seen above, not only to break the tenacity of stiff clay and improve their friability, but also prepares them to be acted on by the atmosphere; while on the other hand, it increases the tenacity of light soils and improves their power of retaining manures, by preventing the exhalation of their nutritive gases. It converts inert vegetable matter remaining in the soil into plant-food by its solvent power. It is not only a solvent of *organic*

remains, but of many *inorganic* constituents of the soil also, setting them free to minister to vegetable growth and development. This may well be regarded as one of the most important properties of calcareous earth. It has also the power of attracting moisture from the atmosphere, thus enabling the crops to withstand the effects of our summer droughts, with little comparative injury.

Assuming, as we have done, that lime and marl constitute the basis of all permanent improvement, and knowing their action in decomposing vegetable and mineral substances in the soil, we need only recommend their use as preliminary to the application of other manures—as auxiliaries in the improvement of our lands. Soils may abound with calcareous matter, but if most of the other elements of fertility are not present in them, it is not to be expected that the presence of lime or marl will supply the dificiency.

As lime has been shown to be of so great importance in any well ordered system of improvement, it is a matter of primary importance to inquire: In what quantity and in what manner it should be applied? In determining this question as it relates to the first branch of the inquiry, reference should be had both to the quality and the condition of the soil. If it is capable of producing a heavy vegetable growth, and is, moreover, full of insect life, then it should be applied in larger measure,—say from 20 to 30 bushels per acre, (enough for a first application to almost any land,) once in the course of an ordinary rotation of crops, if followed up through successive rotations until the maximum of about 100 bushels per acre shall be reached, which is as much, I think, as any land requires; but if the soil is thin and barren, a smaller quantity would be required, at first, which might be gradually increased through successive rotations until the same maximum is attained.

With respect to the condition of the land for receiving lime, it is best used I think as a top-dressing, to be repeated at intervals, as above intimated. I am induced to believe, after careful observation, that where there is grass or a sod to be treated, it is best to apply the lime some months, or I may even say, a year or more before it is ploughed in. I know that in making this assertion I am in direct opposition to the usual practice of our farmers. As to the time of applying it to crops—especially the corn crop—it seems to be the prevailing opinion among nine-tenths of the farming community, that it should be scattered over the land after it is ploughed. I have, on several occasions, followed this method, and after thoroughly raking the land, planted corn, but, in every instance, I have found the results less satisfactory than when the lime was scattered over the grass and ploughed in together with the sod. It is with diffidence that I dissent from a practice so general among intelligent farmers, but believing it to be erroneous, I must adduce some of the reasons upon which this contrariety of my opinion to theirs is founded.

We have seen that lime, acting in conjunction with the atmosphere, decomposes the vegetable substances contained in the soil and converts them into food for the crops. In order then to the performance of this important function, it

is necessary that it should be brought into direct contact, or at least, in juxtaposition with the vegetable matter to be affected by its action. This cannot be so successfully done by a surface application after the land is ploughed, especially if ploughed according to the practice of the best farmers, namely: to the depth of ten or twelve inches as it would be by ploughing in the lime and sod together. The chief objection urged against my practice is, that lime being heavier than earth, has a tendency to sink, and should, therefore, be applied to the surface after the land is ploughed. This is the very reason why I prefer to plough it in with the vegetable covering of the soil, especially when applied sometime before, because its action is more immediate, when so ploughed in, and it is retained in a favorable position to be soon again brought to the surface, that is, by the next ploughing. Whereas, if applied upon ploughed land as a top-dressing, there is reason to fear that, meeting with so little obstruction to its descent, it may sink too far below the ordinary range of the plough to be ever again brought to the surface when the soil is afterwards subverted. I am aware of my seeming temerity in attacking a practice of such long-standing and general acceptation as to have attained the authority of an established axiom; yet, after fifteen years experience in the various modes of applying lime, I am constrained to dissent for the reasons briefly set forth above.

There is another mode of applying lime, which is growing in favor, namely: to scatter in the months of February or March about ten bushels broadcast over the growing crop of wheat. I have known instances of great advantage to the wheat crop derived from such application, and it has this additional recommendation, that it always promotes the growth of the vegetation which appears in the wheat field after harvest.

As to the best mode of distribution of lime, a few words will suffice.

Some farmers may prefer using a machine called the lime-spreader, others to distribute it from the cart in the act of unloading, while a third class prefer to have it disposed in piles at regular distances, and in prescribed quantity on the field, and then distribute with the spade or shovel. I have adopted the latter mode as decidedly preferrable to either of the others. I check my land each way with single ploughs, using stakes 27 feet long, then, with cart or wagon, I deposit in the centre of each square, having cleared the surface by scraping it, a half bushel of lime, which is then scattered evenly over the surface. I have generally reserved this operation for the month of August, but it may be determined, as to time, by the selection of an opportunity which least conflicts with the application of the forces of the farm to other employments.

What has been here said of lime is intended to have equal application to the calcareous earths of Virginia, especially of those of Pamunkey and James rivers, which are better than lime; as in addition to that substance, they contain gypsum, potash, soda and animal and vegetable remains, which constitute them a mine of wealth to the proprietors, and the adjacent districts enjoying the advantage of water transportation. It is this marl which has given such celebrity and

high value to the farms bordering the James and Pamunkey rivers. As there are two varieties of marl—the Miocine and Eocine; the one combined with clay and the other with sand; their application not only supplies the lime necessary for a productive soil to possess, but adds clay or sand as the one or the other may be used to meet the requirements of a stiff or light soil.

I have already occupied more time and space with this branch of our general subject than I intended, but if I can succeed in arresting the tide that flows so strongly in favor of bought manures, and direct it into the right channel by inducing a more general use of *lime, plaster, clover and peas*, I may claim that I have not labored in vain, but have done the State some service.

To follow the application of lime, in whichever of the forms indicated, with artificial grasses is, as I conceive, the first step in any well arranged system of improvement. Among the grasses, my preference has long been given to clover as the best of all grasses, not only for the purpose of improving the soil, but also as affording an abundance of good and nutritious food for stock. The turning in of green crops after an application of lime or marl is practised by many of our farmers, and on light river flats the pea more than any other green crop is used, because they grow much more luxuriantly, and thus afford more vegetable matter to serve as manure. The mode usually adopted in their cultivation, is to fallow the land in the month of June or July, then sow the peas and harrow them in. I have known them, in a few exceptional cases, to produce heavy growth even when sown as late as August, but as a general rule it is best not to defer sowing later than the middle of July. The best time for turning the pea fallow under is early in the month of October.

Another mode of cultivation, with those who practice on the three field system, with a standing pasture, is to sow the peas in the field of growing corn at the last working, and cover them with the cultivator or rake. This process of laying by the corn is a good one for the crop, but does not always secure a heavy growth of vine for the enrichment of the soil. It, nevertheless, is a good preparation for the following crop of wheat.

I will proceed now to consider *Guano and other bought manures.*

These have been extensively used in this section of Virginia, and I believe guano was used in this county as early as in any part of the State. I do not know the first individual who has made a fortune by it, but I do know several who are some thousands of dollars behind hand in consequence of its use. I happened to be in Baltimore in the fall of 1845 or '46 when I purchased half a ton, which then cost me, delivered at my landing, nineteen dollars. I applied it to about three acres of land—nearly 400 lbs. to the acre—which was scattered over very good land, and the result was not over three or four bushels of wheat to the acre more than the surrounding land yielded. I afterwards used it some four or five times, never having purchased more than five tons at any one time. I have since abandoned its use altogether, and can truly say that my original outlay has

never been repaid. I must, however, say that I am greatly indebted to the advice of an esteemed friend for having entirely abandoned its use.

On my way to Richmond, in crossing the Pamunkey river, at the Pipentree, I was delayed, and my friend in the course of our conversation on the subject of guano, informed me that most of the surplus of his crops of corn and wheat, were loaned out to farmers to purchase guano with, and that he did not believe that they had realized one cent from the use of guano, besides owing the money for the guano. The expectation of making large returns from its use had engendered speculation amongst farmers, and that they really were worse off then than if they had never purchased a ton of guano. My friend, however, had been, and is now, constantly using the green sand marl, found along the Pamunkey, has not only a fine farm, but makes large crops, entirely by the use of marl, clover and peas. He is, what is rarely to be found in this section of Virginia, a thrifty farmer. Now that the fact is notorious that guano, and all the varieties of manipulated manures, are in the hands of speculators and their agents, it becomes us, as farmers, feeling a mutual interest to rescue it from their hands and place it under the control of those who have won our confidence. Never has any class, in any community, suffered so much as the farmer, by speculators; his lands, his crops, and his manures are now under their controlling influence, so that, in many instances, he is not really purchasing what he supposes; especially is this the case with guano, as I hear that frequently our native dirt, with here and there a sprinkle of guano, has been imposed upon an unsuspecting purchaser. Ashes and bone dust are certainly of great value, and if they could be obtained at any thing like a reasonable cost, and could be warranted genuine, they would be great improvers, and I believe, they would pay in using them; but the same objection is here met with as in the case of all bought manures. There are other compounded manures, such as "*Manipulated Guanoes*," "*Salts*," "*Renovators*," &c., &c., (their name will, I am sure, be legion in a few years,) all made by different *Chemists* and *Doctors*, and the manipulators themselves differing in their compounds, and deprecating the use of the particular nostrum of their opponent, is a sufficient guaranty that they all will not answer the same purpose; and, added to the fact that they have not improved or benefitted our lands and crops, is sufficient to warrant us in recommending other cheaper and better manures. Such all will agree, are BARN-YARD AND STABLE MANURE.

Since the introduction of bought manures very little attention has been given to this most important branch of all improved agriculture. This is the valuable and prolific source from which the farmer is, by his own efforts and economy, to improve his land. It is the great reservoir from which he is, by his own industry and management, to draw supplies for the improvement of his land, as well as, in a measure, to derive his wealth, and he should husband his resources in such a manner as to have a constant eye to the accumulation of, not only all the excrementitious matter from his stock, but all the decaying vegetable matter from

his farm. The greatest negligence now prevails among many farmers, in relation to proper attention to their barn yard and stable manures, and the voidings from cattle. The evaporation of the nutritive portions of these manures, would, if properly guarded against, improve more land than what is effected by the little they carry out upon them. There is nothing which a farmer can more judiciously use than plaster, in absorbing and fixing the valuable properties of manure, which are constantly escaping in the form of gases. I would then advise the liberal use of it, also, in all the vegetable manures raised upon the farm. It is essential in all well regulated and ventilated stables and cow sheds, in preserving the health as well as the eyes of the animals, from the noxious exhalations of the pungent, if not poisonous gases, which are constantly escaping from the manures. Plaster repays the farmer who uses it, ten-fold. I conclude this subject by strenuously advising a more careful and constant attention to the accumulation and preservation of barn yard and stable manures.

In conclusion, whether you have the stiff clays or sandy loams to contend with on your farms, if you desire to restore them to fertility, you must give them the advantages of *Lime*, *Clover* and *Plaster*, with a regular rotation of crops. You must lend all your energies to the accumulation of manures—*animal, vegetable* and *mineral;* you cannot expect your lands to yield remunerating crops unless you continue to keep up their fertility by liberal applications of manure. Should your barn yard and stables fail to afford you a sufficient supply, you should go to your marshes, woods, and ditch banks, and there find the materials for manure. We know the chief element of all manure is vegetable matter, and its production being necessarily slow and laborious on exhausted soils, we should take advantage of every assistant, in increasing and applying it to the soil.

Wm. D. Gresham.

King & Queen County, Va.

From the British Agricultural Magazine, Plough and Farmers Journal.

Chippenham Hundred Farmers' Club.

What has Science done for Agriculture?

Mr. Scott read the following paper:—

In endeavouring to answer the question, "What has science done for agriculture?" I must ask—as I feel confident I shall obtain—your indulgence, from a deep sense of my inability to do justice to the subject, and from the fact of my not having had many days to prepare myself to bring it forward. I must claim your special attention to the remarks I shall make, as it is difficult to bring the facts and arguments of the case into a focus, to enable them to be easily seen and clearly comprehended by the general body of members of clubs such as this, who, however prompt and ready in their practice to avail themselves of the results of scientific discoveries, are not likely to be in the habit of discussing the processes by which they are arrived at. And here I would observe that it

can never be reasonably expected that farmers in general should become scientific scholars by studying the abstruse principles of chemistry, or by learning the botanical names of 50,000 plants, that they may cultivate a dozen. All experience is opposed to this, or to their turning aside from that course and from those processes which have been confirmed by the experience of centuries, and in which alone lies their safety. But when farmers know the principles on which their successful practice depends, agriculture then becomes a *science*, and remains no longer only an *art;* and you will all, no doubt, admit that one farmer with a knowledge of science must possess advantages over another without it, both being equal in practical ability. Take as an instance that both parties farm a thin soil, composed of inert vegetable matter, resting on what is called a moor-band pan, which is bound together by sulphate of iron, and discharges that yellow sediment so often seen by you in your ditches, called oxide of iron, so poisonous to vegetable life. Suppose this land to be managed exactly alike, until it came to be fallowed for green crop; then the one applies dung, because he knows it is usual to do so at this stage; but the other—the man of science—applies lime, and ploughs it in, that it may come in contact with the pan below, knowing, as he does, that the lime will liberate the potash and decompose the sulphate of iron, and, by taking up the sulphate, become sulphate of lime or gypsum, thereby affording suitable food turnips, wheat, and clover. The result in the former case will be almost an entire waste of the manure and a stunted crop of roots.

Until very recently science has been so little recognized as a handmaid to agriculture, and has met with so many rebuffs in its advances, that its progress has no doubt been retarded; so much so, indeed, that though it is many years since "Tull" wrote and "Davy" lectured, it would be much more easy even now to say what science proposes to do, than what it has actually accomplished for our profession. Fortunately, it is now recognised by agriculturalists as a body, and those farmers who endeavor to engraft it on their practice are no longer designated "mere theorists." Science never claimed the power to enrich individuals any more than our Club does—but only to improve our general practice and elevate our profession; and therefore it ought to be encouraged, or, at least, treated with that degree of forbearance necessary to enable it gradually to develop its resources. The facts of science generally, if properly tested by careful experiments and brought before us on high and reliable authority, are not to be put lightly aside, like many of the extravagant theories that start up around us from day to day. But, nevertheless, when we find men, as we too often do, of note and intelligence, propagating doctrines of practical value, such as that lightning and electricity stimulate production, and inducing sanguine farmers to surround their fields with wires to catch it—when we see such men as Prof. Liebig giving forth that plants require only an imperceptible amount of mineral food from the soil, the rest being supplied by the atmosphere—and publishing that one of the best manures for land is burnt straw or ground glass, and encour-

aging farmers to hope that the time had almost arrived when, in place of the cumbrous apparatus of farm yards and dung carts, they would have a laboratory in their fields to manufacture silicates and phosphates—when we find, I say, scientific men giving the weight of their authority to such doctrines as these, we need not much wonder that practical farmers so frequently turn their backs on science, and that its progress amongst them has been so materially retarded. An injurious effect, in the same direction, has, I think, been unfortunately produced by the expressed views of so many of our great agricultural authorities—such as Arthur Young, Dr. Coventry, Prof. Low, and all others—all of whom have discouraged the farmer from bestowing much study or placing almost any reliance upon the results of science. I will just read to you Prof. Low's remarks bearing upon this point, as he is undoubtedly the soundest instructor in practical farming we have ever had, and the greatest living authority.* "It is in Germany and France," he says, "that chemistry and vegetable physiology have been cultivated for the longest period as a branch of agriculture. But when we inquire in what manner these researches have improved the practical art in either country, we have only to consider the nature of the subjects themselves to be assured they cannot have done so in any sensible degree. They are seen to be the mere opinions of learned men, formed, for the most part, in the laboratory and closet, without a due knowledge of the business of the fields, and the modes by which agriculture can be cultivated as a branch of industry. Let us turn again to countries where theories of vegetation have been unheard of, and we shall yet find the art of husbandry in a high state of advancement. In the Netherlands the surface of the country is like a garden, and every available resource has been resorted to for rendering it fertile by the industrious inhabitants. In the North of England, and a part of Scotland, a system of agriculture has been established which has multiplied the resources of the country in a great degree; yet in the forming and perfecting of this system physiology and chemistry have had no share. If we turn to the sister art of gardening, which is the child of experiment in every country, we shall find that it has been perfected without the aid of those theories and researches which many hold to be necessary."

Notwithstanding this, I think the many scientific truths which have been floating in the atmosphere around us, are now beginning to stick to the agricultural mind, and as the soil is good, I have no doubt they will soon germinate and bear good fruit.

As a proof of their gradual progression, we find the Royal Agricultural Society of England at its formation, about 12 years ago, adopting the motto, "Practice with Science." Liebig soon after published his "Treatise on Agricultural Chemistry," by which he obtained an European reputation. This was followed by the farmers of Scotland subscribing upwards of £2,000 to establish a chemical association in that country, and support a professor at £500 per annum. The Cirencester College did the same, and its professor, Mr. Way, has repeatedly

* Prof. Low has since died.

been invited by the Royal Agricultural Society to deliver lectures at its annual meetings, which he has done with great effect. Prof. Johnston has also published his popular lectures, and a branch of agricultural chemistry has been established in several common day-schools, and its importance has been recognised in many other ways.

Agricultural chemistry, however, although so prominently put forward, and undoubtedly deserving the first place, must not be supposed to constitute the only physical science bearing upon the interest of agriculture. Geology, botany, meteorology, physiology, etymology, natural history, and medicine, all, more or less, seek to connect themselves with its principles and practice. So, likewise, may mechanical science claim some credit for its many inventions in aid of the business of farming.

The distinction between science and art I need not define. You are all aware that science explains the cause of results by a course of reasoning from fixed principles; nay, it takes a higher sphere, and by the same process it predicts, foretells, and guides. Art, on the contrary, only executes the edicts and decrees of science. The art must, therefore, in a certain sense, be subordinate to the science of farming. A Watts may have the genius to invent a steam-engine without the practical ability to construct it; so a Napier may have the talent to construct one, without a knowledge of its principles. Again, a Liebig may know what will produce a certain crop, without the necessary skill to grow it; and a farmer may possess the necessary skill to raise the crop without being aware of the causes which produce such a result. Thus a chemist may be a good philosopher without possessing a knowledge of farming; and a farmer may be a good agriculturist without possessing a knowledge of the theory of production. The one, you will perceive, partakes more of an intellectual and reasoning operation; the other more of a mechanical.

Both physical and mechanical science have advanced manufactures; and why, let me ask, should their aid not be equally beneficial to agriculture? Until of late years farming operations were guided in a great measure by local experience, acquired by long and expensive courses of practical experiments; and there certainly can be nothing more valuable than the results of experience in farming; but with the aid of science you will be enabled to acquire the same knowledge in less time, and be prevented from taking those false steps which you are apt to do when trusting to experience alone, and refusing the assistance of well-ascertained principles. Had Davy or Liebig lived as contemporaries of Tull, to explain the sound principles which he promulgated but could not defend, those great principles (applicable to all soils and in all climates) would not have lain dormant for upwards of a hundred years, only now to be revived by men whose scientific minds have enabled them to penetrate that theory, which ought to have been yielding incalculable wealth to the country a century ago.

Again, take the case of land drainage, and I think your personal experience and observation will bear me out in saying that nine-tenths of all the drainage

done in this country previously to the last fifteen years, or until Parkes elucidated the true scientific principles of draining, has been most imperfectly executed, and that the expenditure was almost entirely thrown away. And here let me remark, incidentally, that though we willingly accord to Mr. Parkes the merit of laying down in his writings the true principles of an efficient land drainage, yet he has unfortunately proved himself to be but an indifferent practical operator when called upon (in consequence of his able writings) to put his principles into practice.

If I may claim your attention for a few minutes longer, I would venture to state a few of the results of chemical investigation. In the first place, it has been shewn by analysis that we can ascertain (with sufficient correctness for practical purposes) what different soils are composed of; as also the elements of plants, and the constituents of manures. We are, therefore, now enabled in our daily practice to supply the soil with those substances in which it is deficient, thus furnishing suitable food to such plants as we may choose to grow upon it. You are all aware that artificial manures are now successfully made through the aid of science, and many of us can adduce cases in which our respected fellow-member, Mr. Proctor, has administered successfully to all varieties of crops on totally different soils. Look to what guano has done, whose value and uses chemists so correctly told before practical trials could be made. As an instance of the value of chemical analysis, take the case of an intelligent and enterprising Lothian farmer, that of Mr. John Dickson, of Saughton, near Edinburgh, who lately purchased from a respectable merchant in Leith several hundred pounds' worth of guano, and had it analyzed by Dr. Anderson, the farmers' agricultural chemist in Scotland, who found it to consist of

Croprolites, worth - - -	£3	0	0	
Gypsum - - - - -	1	5	0	
Genuine guano - - - -	0	15	0	
In all - -	£5	0	0	
And for which Mr. Dickson had paid -	9	10	0	per ton.
Thus showing a loss of - - - -	£4	10	0	per ton,

which he detected by means of this analysis, and recovered from the seller upwards of £100.

The process of dissolving bones with sulphuric acid is also due directly to the inductive principles of chemistry, and was first tried by Liebig, because he knew from scientific principles that this process would produce the desired result of liberating the phosphates in bone and making it fit for the food of plants. Having had much experience in the use of bones, I can confidently assert that for general purposes, either as a top dressing or for underground manure, 5 cwt. of dissolved bones, called "superphosphate of lime," costing (in Bristol) 40s., is to be preferred to a ton of raw bones, costing £6.

Again, chemistry has shown that a small brown stone, called a *coprolite*, which

is found in abundance in several parts of England and in Spain, and also, I believe, in America, and is said by geologists to be the fossil dung of an antediluvian lizard, is a good inorganic manure, and I have seen it used with success at the Cirencester College Farm.

Chemistry also explains the ingredients which both cattle and crops remove from the soil, and what is required to replace them. Thus milch cows, we know, impoverish the land they pasture on, and analysis shows that the milk they yield contains a large quantity of the phosphates, which is the principal food of grasses and clovers; and when the excrements of dairy cows is examined, it is found to be thus much poorer. From this cause the farmers in Cheshire—the greatest dairy county in England—are constantly restoring those phosphates to the soil by top dressing their pastures with bone dust. Young stock, on the contrary, only remove the quantities of phosphates and other ingredients required to form their bones and flesh, and their dung is so much the richer than dairy cows.

It is now also pretty well ascertained what materials particular crops remove from the soil, and one curious fact is, that from an acre of land 10 inches deep and weighing 1,000 tons, 20 crops of wheat, at 35 bushels of grain and 2 tons of straw per acre, only remove of minerals of all sorts 0.248; and it was supposed by Jethro Tull, and now by many even practical men, that nearly all the other elements of wheat may be derived from the atmosphere, by stirring the soil and allowing it to have free access to the plants.

It has now been clearly established by Prof. Liebig, that the heat of the body, both of man and animals, is the same in all climates and temperatures—that the chief source of animal heat is carbon—and that our food is the great source of carbon. In cold weather, therefore, when the body gives off an an increased amount of heat, a proportionate quantity of food will be necessary for our stock, in order to keep up the due temperature of the body. Hence the advantage, nay, necessity, of keeping our feeding animals always moderately warm and beyond the reach of cold currents of air, not merely to save food, which the most of us know it will do, but to conduce to their general health. A beautiful fact in connection with this circumstance is, that the oxygen gas which animals are constantly wasting by respiration is again supplied by what is given off from growing plants, which extract carbonic acid gas from the air, retain the carbon, and set the oxygen free, thus maintaining a beautiful law of compensation.

Again, how marvellous the fact that it is within the individual power of any of us to carry to the field sufficient manure, in the shape of superphosphate of lime or guano, for an acre; but it would require an Atlas to bring back the crop that such manures would produce.

See, then, in these facts, the realization of what science predicted fifty years before such things were thought possible. And had Lord Kames lived in our day, his memorable remark that the time would come when a farmer might carry

as much manure in his hat as would suffice for an acre of land, would not have subjected him to the witty and sarcastic retort, that he would be able to bring home the crop in his waistcoat pocket! For the rapid strides that science has made within the last ten years—the extraordinary discoveries that have taken place—the increasing mastery of mind over matter, making nature reveal, as it were, her inmost secrets—leave no man at liberty to dogmatize of the future. It looks, indeed, as if we had, at last, found a key to unlock the boundless store-house of nature; and he only, who from time to time heaves the log into the deep, can fully appreciate the strength of that vast intellectual current that is sweeping along with such irresistible power.

I have dwelt so long on chemistry that I will only add that geology indicates the kinds of crops and stocks most suitable to a district; botany—the plants, their sexes and habits. And here let me remark on the beauty and peaceful influence of that science whose votaries are to be found in all parts of the habitable globe, in the deserts of Africa, in the wilds of America, and amongst the distant islands of the Pacific, the pioneers of peace and good will amongst nations, and constantly returning to enrich their native land with their newly discovered treasures.

Meteorology has given us the barometer and thermometer, and taught the signs of the weather, and the effects on climate, of draining, planting, and cultivation.

Physiology teaches us the structure of animals and plants.

Entomology the habits of insects, by which we may sometimes ward off their destructive depredations, or destroy them.

On the continent this subject commands the attention of governments. In France, Germany and Belgium, local laws are from time to time enacted for the destruction of insects; and commissioners are appointed to investigate their economy, and to suggest plans to arrest the evils arising from them, and in many cases efficient means have been devised to stay the mischief. The ready manner in which insects may be imported from foreign countries with our grain, and naturalised here, and the fact that such has been the case in many instances, ought to make us more alive to this subject, and induce us to be more attentive in keeping our barns, storehouses, and granaries clean and well aired.

Natural history enables us to know the habits of the birds and animals that frequent our fields, and their good or evil propensities, and may sometimes induce us to mitigate our unqualified condemnation of the persecuted, but nevertheless useful rook.

Medicine can give us enough skill to enable us, in emergencies, to administer to the ailments of our dependent animals.

And lastly, mechanical science has conferred upon us inestimable boons; for who can reflect on the improved ploughs now in use without thinking on James Small, the working blacksmith? or on the thrashing machine, without a feeling of gratitude to the humble Scotch mechanic, Andrew Meikle? or on the now all

but perfect reaping machine, without esteem for the labours of the Rev. Patrick Bell, and acknowledging that we owe something to mechanical ingenuity and science? So, also, has it given us the steam engine, to thrash and winnow our corn, and then to carry it to market and bring back the master-farmer manure. And its most recent production, Fowler's draining plough, is not unlikely to work a great change in draining, in cultivation, and in climate; for I can confidently say, from a personal knowledge of its construction and practical operation, that it is not a mere rude machine to be dragged along by brute force, but one constructed on strictly scientific principles to reduce the power of draught and resistance, and to produce the desired action on the soil.

A liberal knowledge of science, then, must make a farmer a more unprejudiced man. It will connect the every-day business of life with a higher class of thoughts and feelings; it will enable him more clearly to comprehend the details of his farm, and so bring the whole into that more perfect harmony by which every operation shall conduce to one common end, with the least expenditure of power and the greatest produce of result; and therein, I conceive, consists the the true art of scientific farming.

A discussion followed, in which the chairman, Mr. Schneider, of Slaughterford, Mr. Painter the secretary, Mr. E. Little, and others took part; and we are happy to be able to add, that although those present were unanimous in considering practical experience as the safest guide, they were equally so in showing a due appreciation of the principles of science.

The following was the resolution come to:—

Resolved, That physical and mechanical science have rendered, and continue to render, valuable services to practical farming; and that, though a knowledge of science is not considered indispensable to a farmer, yet such an acquaintance with chemistry, geology, botany, meteorology, and mechanics, as can be acquired by the ordinary habit of reading and observation, is desirable, and would be found a valuable addition to practical experience.

LIQUID MANURE FOR GARDENS.—Every man who has a sink spout has a fountain of wealth at his back door. You laugh at the idea, for you have never tried it. Make the experiment and you will laugh at your own simplicity for overlooking a stream that abounds with gold dust, as really as Pactolus. The application of liquid manure to meadows. on farms may be at some distance in the future, but for its use in gardens the time has already come.

If you have nothing better, sink a half hogshead a foot or two in your garden, in the most convenient place, and run a leader from your sink spout into it. A watering pot is the best thing to put it on with, but not at all essential. An old pail and dipper, kept for the purpose, will answer. When the plants are well up and begin to grow nicely, apply the liquid two or three times a week, just at night. It is excellent for vegetables and small fruits, and for grapes and pears until they begin to approach maturity. It not only increases their size, but improves their flavor.—*American Agriculturist.*

For the Southern Planter.

The Grasses best adapted to Virginia—The Mode of Culture, and Manner of Curing, &c.

In this day of progress in the science and practice of Agriculture, the future is full of promise to the farmer. With every step of our progress in improvement, in the processes of husbandry, we should see to it that we advance, also, in the great business and chief aim of life, that is, not to add field to field, to pull down barns and build up greater, but to improve our minds, our hearts and our lives, so as thereby to benefit the world in which we live. Keeping this superior object and end distinctly in view, I propose to take the privilege of submitting a few thoughts which have occurred to my mind upon the subject which heads this article.

The ages of Fable, although long since passed away, have been fairly outstripped by these days of *Fact*. The dreams of Poets, and the speculations of Philosophers, are more than realized in the achievements of modern husbandry—and the deed is none the less wonderful because it has not been instantaneously performed. But however satisfactory the practical results already realized, by the application of mind to Agriculture may be, the subject is still open for investigation, and presents the highest encouragement for further research. There are secrets yet locked up in the soil, which, discovered, will enable us to double the certainty, and the measure of reward for labour and every fact carefully noted, tends to open the pathway to their attainment.

The husbandman may never be able, even if he so desired, to "sow Dragon's teeth and see armed men rise up from the soil, to desolate the Earth, but he can do a greater deed, he can stamp on the ground, and see lowing herds, white fleeced flocks, and neighing steeds, rise at his bidding. Animals more perfect in form, more profitable in their yield and labour, than any of the nations of antiquity ever saw."

To fertilize and improve the farm, ought to be the prime *temporal* object of every proprietor. Agriculture may be legitimately considered as not only the stimulus to industry, but also the source of abundance, comfort and health. In perfect harmony with these, it also subserves the higher purposes of promoting good morals and acts beneficially even upon religion itself. All national aggrandizement, power and wealth, may be traced to Agriculture as their ultimate source. The American Farmer, then, equipped for his employment, and tilling his grounds may justly be regarded as belonging to the order of real noblemen.

Without further preliminary remarks, I come directly to my subject, which is, of itself, sufficiently fruitful to occupy the few pages, I propose devoting to this article. The subject is one about which more is said, considerably more done, and doubtless more thought upon, than perhaps any other affecting the interests of the farmer. It is, in truth, a subject of absorbing interest, and of primary importance. Indeed, taking the whole country into the account, the single item of *grass* is far more valuable than any other product of the soil. It far outstrips

corn, cotton and wheat, which generally attract more attention, because they are more generally sold, and therefore affect more sensibly the commercial exchanges of the country.

But the lowly grasses, that our cattle graze during the summer, and which when dried, form their principal food in winter, are of more importance to the prosperity of the country, than any other single crop.

Of the various grasses that have been to a greater or less extent cultivated in Virginia, I will mention only those that by actual experiment and observation, have been found adapted to the soil of the State. These, I think, are sufficient to meet all the wants of Agriculturists, for whatever purpose they may desire to appropriate them. There are others, however, that I might mention, in proof of whose merit, I might give quotation after quotation, from authorities above reproach; still, they have not been sufficiently tested by experiment, and hence, we must, as yet, regard their adoption of doubtful expediency. Those grasses to which I particularly refer, as being of established adaptation to the soil of our State, are orchard grass, blue grass, Herd's grass, timothy and clover.

The orchard grass, sometimes called "Rough Cock's Foot," and known Botanically as "*Dactylis Glomerata*," though regarded by many, as being very valuable, is not so generally popular among cultivators as some of the other grasses. It has in its favour, however, qualities that ought to cause it to rank with the best grasses of our State—such as its rapidity of growth, ability to endure drought, large yield of fodder and seed, and also its permanence. To which we may add, it bears shade well, and is thus adapted to orchards, its popular name being derived from this characteristic. It is a coarser and harsher grass than timothy or herd's grass, is less nourishing, and grows in tufts instead of covering the surface evenly. There is a diversity of opinion, as to the relish with which it is eaten by stock, some affirming that they prefer it to all other grasses, while others say, it is neglected, where other kinds are at hand. All agree, that for *summer* grazing it should be kept cropped short. My own opinion, based upon personal experience, with regard to orchard grass, for grazing purposes, is that for *winter* or early spring, it is preferable to all others, from the fact that it is more hardy, and remains green, rich and juicy through the winter. It is a well known fact, that the quality of all the grasses depends much upon the location, character and management of soils, and to this fact, undoubtedly, is due the difference of opinion respecting the value of orchard grass. Experience has shown, that in many sections, it is inferior to timothy, particularly for meadow. Still, under other circumstances, it may be preferable. When intended for mowing, it should be sown with clover, from the fact, that it blossoms about the same time, and is thus fit to cut before becoming too rank. One bushel of seed to the acre, when sown with clover, or two, when sown alone, is the usual quantity. A very light brushing, to cover it, is sufficient. Experiment has proved, that the greatest number of seed germinate at a depth of from one-fourth of an inch to no covering at all—but merely lying on the surface.

In speaking of Blue grass, to which I next call attention, I shall refer to it simply as a *grazing* grass. As to seed, it may be considered prolific; but for *hay*, whilst it may be, perhaps, as nutritious as any, yet it affords a very light swarth. It will grow on almost any soil of ordinary fertility, but succeeds best on limestone lands. Where such soils predominate, it has obtained a world-wide celebrity; but even here, in our free-stone lands, amid the "red hills" of old Virginia, on soils of other character though not indigenous—it succeeds most admirably, and is being extensively cultivated. It sods deeply and heavily, makes an even surface, and grows most luxuriantly to the height of eight or ten inches, scattering stems shooting out, and springing up a few inches above the general height on which the seed is borne. From ten to sixteen pounds should be sown to the acre, on a smoothly harrowed surface and brushed over in the usual way.

Herd's grass is the next variety which presents itself in my catalogue of grasses adapted to the soil of Virginia. It stands among the best variety of grasses according to chemists, and some cultivators contend that it commands the decided preference of cattle, when put in competition with other kinds. Analysis does not always agree with instinct, but when animal tastes verify the decisions of the Laboratory, doubt is no longer admissable. Upon this subject, so far as my individual opinion, based upon personal experience, is concerned, I am very slow to acknowledge any grass as superior to timothy for hay. This much I *do* concede, that there is as much difference in the nutritive properties of the different grasses as there is in grains or fruits. Analysis shows this, and the instinct of cattle indicates as much. Herd's grass is very popular and is destined to become more and more so, as acquaintance with it increases. Indeed, some of its characteristics will ever recommend it above all other kinds, so long as there are worn out lands to reclaim, gullies to fill, or galls to heal. Its adaptedness to these purposes is universally acknowledged. I consider it inferior to blue grass for grazing, but for hay, greatly superior, and scarcely inferior to any other kind. It has a soft delicate stalk, seeds well, and rarely fails to make a crop. It may be sown alone, or with other grasses, either in Spring or Fall. If alone, at the rate of from ten to fifteen quarts per acre. I now call attention to Timothy—the fourth variety laid down in my catalogue. This is universally a favorite grass with every modern agriculturist who has the energy and enterprise to fertilize his soil sufficiently for its cultivation. It will not grow to perfection upon poor land, hence the preference over it, given to so many other grasses of far less merit. The prevailing opinion, however, that timothy will only grow upon rich, moist, bottom land is erroneous. It is true that lands naturally moist, such as reclaimed swamps, or that are susceptible of irrigation, are better suited to its cultivation. But I have this year, mowed upon my own farm—on upland—timothy of as good quality and yield as I have ever seen upon *any* land of whatever character. Upon lands of suitable fertility, it sods well, grows luxuriantly and seeds and fodders abundantly. I think it advisable in seeding with timothy, to mix it with clover, from the fact that they are a mutual support to each other, and the clover affords

a handsome swarth, whilst the timothy sod is being formed. It is the usual custom to sow timothy with other crops, either in Winter or Spring, but I have always succeeded better to sow it alone or with clover, from the twentieth of August to the middle of September. From eight to twelve quarts should be sown to the acre.

Of *clover*, and its adaptedness to the soil of Virginia, enough has already been said, written and experienced, and it would seem a work of supererogation to lug into this article, already too long, anything upon the subject, hence, I will only remark, as a vegetable fertilizer, it is without an equal, for grazing purposes very superior, and for hay, when fed from the mow, equal to the best. About ten pounds, or one sixth of a bushel, per acre, is the quantity usually sown. As it regards the quantity of grass seed to be sown to the acre, the question can only be answered approximately. Where, for any reason, it is difficult to make seed *take*, it may require an addition of as much as twenty-five per cent, or one peck to the acre. Again, on very rich land, where seed would *tiller* exuberantly, it is the practice to diminish the amount sown. A table giving a fixed, invariable quantity, would often mislead, for the reason, that quality of soil, method of cultivation, climate and location, all, vary the certainty and manner of growth. In this, as well as in almost every other operation on the farm, individual judgment must be exercised. For the successful cultivation of the grasses, much depends upon the preparation of the land. First, examine the premises in every part to see if draining is needed. If there are any wet, spungy places,—any spots covered with sorrel moss or coarse wiry grasses,—there, of course, ditching is a necessity.

This being done, unless the land has sufficient fertility, give the surface a thorough coat of manure, from the farm-pen or stable—not with a view of making the soil rich only, but of making it warm and porous.

Next in order, comes a thorough breaking up of the soil—by subsoil ploughing, and I wish to be understood when I say, thrust down your plough-point into the yellow soil, with a strong arm, if you would have your meadow luxuriant, and your sward to hold its freshness throughout the heats of Summer. This being accomplished, harrow and *re*-harrow, until it is thoroughly pulverized; then sow down your seed, and run it over with a roller, or brush, the roller is preferable.

When your grass is from two to four inches high, give it a heavy coat of plaster, and in early Spring repeat the application, and my word for it, you will have a meadow that you will look upon with pride and pleasure.

Haying should commence with the proper maturity of the grass, which is about the time the bloom passes away, and the seed begins to form. *After* this, the stalk changes to woody fibre, thereby losing much of its sweet and nutritious properties.

The question of mowing, though not embraced in my subject, yet, in approaching the next proposition, my memory involuntarily runs back into the dim vista of Time, even to the days of "Old Fogyism," where, in imagination, I see the

mower, as he bends to his work, from the early morn to high noon; while I remember there used to be *poetry* in his work, before I knew anything better, and thought him a "fitting type of the Great Destroyer," but the poetry is transferred from the scythe to the "mounted car," and "there is music, too, in the sharp clatter of its triumphant march." I see smooth, evenly spread grass, as it lies in the track of the mower, as I never saw it in the roughly-piled swarth made by the scythe. It suggests no painful posture, no strain of the muscles, no "sweat of the brow." Invention is at length consolidated into an effective machine, that puts the once much-dreaded hay harvest completely under the control of the husbandman. But enough about machinery: The harvest waves impatient for the reaper, and the hay must be secured. Then let us be astir with the earliest light, and lead the mowers to the field, and when the heat becomes oppressive, we will seek the shade until the air is tempered by the evening breeze, when we will at it again with renewed vigor, after the long mid-day rest.

The grass being cut, now for hay-making—one of the most useful and pleasant occupations on the farm. It is a treat to labor among the new-mown grass, whilst the atmosphere is redolent with its grateful perfume. Nothing is more refreshing than the air which the gentle breeze of Summer wafts from the fields and meadows, when the grass is in preparation for its Winter deposit.

The horse-rake should follow the reaper or scythe, drawing the hay into wind rows, which should be cocked up, when sufficiently dry not to ferment. Hay, cured in bulk, is much better than when left exposed to the sun until perfectly dry. If possible, no dew should be allowed to fall upon hay in the swarth, except that which is cut late in the day. So soon as the hay is sufficiently seasoned, barns, sheds, and other preparations for its reception being complete, store it away, occasionally sprinkling it with salt. This not only assists in keeping it in good condition, but renders it more palatable, especially if of inferior grass, or not in good order when stored. The common practice of stacking hay in the field is not to be commended, but may be resorted to when impracticable to find shelter, or room to stack it in the farm-yard. The stock must necessarily be exposed while feeding (unless temporary sheds are erected, which is seldom done); much manure is wasted, and an unsightly spot is left in the meadow. Shelter for hay, however rude, is greatly preferable to stacking, and no good manager will attempt to dispense with them.

My argument is before you. I may have been tedious—but I trust my manifest zeal will be a sufficient apology. In conclusion, let me say, to *fertilize* is the Alpha and Omega of all profitable farming. Feed the soil, and the blades of grass will spring up, not only two, five and ten to one, but sixty and an hundred fold.

Respectfully submitted,

ROBERT C. JONES.

Brook Hall, Bedford County, Va.

For the Southern Planter.

Extracts from Sir John Evelyn's Diary and Correspondence.

August 29th, 1668.—"I went to see Sir Elias Leighton's project of a cart with iron axle-trees."

The above is an extract from that very entertaining book, "Diary and Correspondence of John Evelyn, F. R. S." As to the success of Sir Elias, in his project with the iron axle-tree, I know nothing; but as he is described by one authority as "a mad freaking fellow;" and according to another, "for a speech of forty words, the wittiest man he ever knew," and with all, "one of the best companions at a meal in the world," I am inclined to think that so useful and solid a thing as an iron "axle-tree for a cart" would make but little progress towards perfection in the hands of the witty convivialist. But whatever may have been the result attending the project of this "boon companion" two hundred years ago, there can, at this day, scarcely be two opinions in reference to the comparative merits of iron and wood axle-trees. The superiority of the former is so obvious that they are rapidly supercceding in this part of the State the old fashioned wooden ones for wagons and carts.

In the same volume, under the date 26th October, 1685, I find the following:

"Sir Richard Bulkley, described to us (Royal Society) a model of a chariot he had invented, which it was not possible to overthrow in whatever uneven way it was drawn, giving us a wonderful relation of what it had performed in that kind, for ease, expedition and safety; there were some inconveniences yet to be remedied—it would not contain more than one person; was ready to take fire every ten miles; and being placed and playing on no fewer than ten rollers, it made a most prodigious noise, almost intolerable. A remedy was to be sought for these inconveniences."

Evelyn does not inform us of the success attending Sir Richard's search after a remedy for the inconsiderable "inconveniences" of his chariot. Some timid persons would, doubtless, be willing to incur the danger of "taking fire every ten miles" in order to be secure against an "overthrow." Were it not, therefore, for the "intolerable noise," the danger of combustion might be borne. The invention of a carriage or wagon that could not be overthrown, might be the means of saving the State some expense in the construction of turnpikes. I commend the subject to our Legislators. Perhaps their wisdom may deem it for the interests of the Commonwealth to offer a State bond, or Treasury note bearing interest, as a reward to the meritorious inventor of such a wagon. The successful inventor of a "*Platform*" that could not be overthrown "in whatever uneven way it was drawn," would soon make his fortune, however great the "noise" or the danger of "taking fire," provided its capacity was a vast multitude "that no man could number."

I will trouble you with but one more extract from Evelyn, it is as follows:

19th May, 1672.—"Went to Margate, and the following day was carried to see a gallant widow, brought up a farmeress, and I think of gigantic race, rich,

comely, and exceedingly industrious. She put me in mind of Deborah and Abegail, her house was so plentifully stored with all manner of country-provisions, all of her own growth, and all her conveniencies so substantial, neat and well understood; she herself so jolly and hospitable, and her land so trim and rarely husbanded, that it struck me with admiration at her economy."

Now, dear Planter, is not this a picture worth contemplating? Does it not make you wish you could travel backwards, along the track of time, for two hundred years? I hope the "jolly" widow soon found herself in the same situation as her land, "rarely husbanded." T.

For the Southern Planter.

Southern Patronage Again.

MESSRS. EDITORS:—I join the Southern Cultivator in regard to an article of the Journal of Commerce, of which you speak in your February number. Here in Virginia, for instance, instead of the Connecticut bell we are aroused by Virginia roosters; our beds are made by Virginia mechanics, the feathers and wool for the same raised on the farm; the family wears homespun and European goods—the latter ought to be, and I trust soon will be, imported by Norfolk. My coffee pays toll in Richmond; heaven gave us clear spring water, and our cows give excellent milk. We buy Southern sugar refined in New York which could be done as well in Richmond, and use some home-made maple sugar also. Very fine pianos can be bought at Baltimore factories. The Massachusetts shoes are not worth having. Phillip K. White in Richmond, and our country shoemakers can beat them; and I would not give one Virginia made saddle for half a dozen Northern. I hope our nurserymen will do all they can to induce us to quit New Jersey. We are also willing to support the Southern manufactories, provided they use all exertion which we can reasonably expect of them—that is to live by industry and a moderate tariff, and not by a high one all together.

The vigor and strength which we have added to the North must be withdrawn from there; and to make a start, our Northern *friends* should be invited to settle in Southern cities, and help to establish a Southern-European trade. It will not do to say that England is as much against us as the North, as we intend to trade with all Europe, and I hope it will not be necessary to prohibit the Northern manufactures.

Whenever we have direct importations, the Southern jobbers can afford to give the country merchant all the facilities which the New York jobber gives now. The high rent for store-room, and high clerk-salary, which the latter pays, and even his extravagance, is no reason why he should undersell the Charleston jobber as you argue on "Southern patronage" in your February number. The New York jobber has to swim with the great mass, and has at present many advantages in buying. He sells to an enormous amount to make his expenses comparatively small, and runs the risk for good or evil.

Our *only remedy* in the South is a direct trade with Europe. This once established, the jobbing trade will follow.

With a distributing Southern city, manufactures to a moderate extent, and our agricultural resources, we cannot fail to be a happy people.

Yours with respect, T. K.

Chesi, March 22, 1861.

For the Southern Planter.

Comments on Articles in the March Number of Southern Planter.

MESSRS. EDITORS.—I was very much pleased with Mr. Ed. Taylor's excellent essay in the last number; it is a useful paper:—perhaps you can make it more so, by supplying a slight omission on his part. In his preparation for the corn crop, he does not say what form of surface he prefers. This is a matter of great importance to most of our farmers. We have a diversity of theory as well as practice, some preferring the old mode of five-feet beds, others fifteen, twenty, and some thirty feet. In all flat countries this is a question of great importance.

Perhaps you may also render your readers service by explaining Mr. Randolph's Farm Accounts.

I observe in some of his accounts, he charges the farm with interest on $40,000 capital invested, and charges also hire of negroes. In others he does not charge negro hire, but charges interest on an increased capital, $45,000. Are we to understand that negroes were included in the first investment? And are we to infer that they increased so as to render hirelings unnecessary? And is the additional $5,000 the increased value of the negroes alone, or of the whole investment—or is it an additional investment of new capital? If the first, or either of the two first, then his account does his farm injustice, if the last, then his dividends decrease as his capital increases. If I purchase a share of R. R. stock for $100, and receive at the end of the year five per cent. dividend, and sell my stock for $120. I have realized 25 per cent.

I knew a gentleman in this county to purchase a servant woman and four boys for $860. In the course of five years the woman, still young, had three more boys, and the eight servants were worth over $6,000.

Several interesting facts are presented in these accounts of Mr. Randolph:—*one*, that wheat is his most valuable crop; *another*, that he lost money by neglecting the corn crop. Had he sold as much corn in 1859 as he did in 1855, it would have amounted to nearly $1,200. *Another*, that his sales of beef and pork never amounted to as much as his corn, 1855, except in 1859, when he must have purchased his beeves, fattened and sold them, but did not charge the cost, while he gives credit for the whole amount of sales. *Another*, that his wool sold for enough, nearly, to purchase his negroes clothing, saving all trouble of spinning, weaving, &c. *Another*, that he made as much when he had no overseer as when he had one.

These exhibits show admirable results, including support of family, (a very legitimate item,) amounting to nearly eight per cent. for five years—and if the $5,000, should be added, a much larger percentage.

I will send you, first opportunity, a sample of corral, of which we have great abundance in the beds of our rivers and creeks. I think Mr. Gilham will concur with me in thinking it equal to any phospho-guano at all.

Very respectfully your ob't serv't, C. C. CURTIS.

Gloucester, March 20th, 1861.

REMARKS.—The authors referred to in the above communication will each take pleasure, we are sure, in answering the enquiries of the writer through our columns. For ourselves, we are glad to find the attention of intelligent farmers drawn to the subjects of the communications of Mr. Taylor and Mr. Randolph, and especially to find so proper an appreciation of "farm accounts" as is evinced by our corrrespondent. We wish the practice of keeping them might prevail universally among the farmers of Virginia, for, strange as it may seem to the unthinking, it would save hundreds of thousands to the commonwealth in curbing extravagance, and in wisely directing expenditures to subjects demonstrated by the ledger to be profitable, and withdrawing them from such as are found productive only of loss and disappointment.—[ED. SO. PANTER.

Kind---Mankind---Husband---Wife.

Let us a little consider the word "kind." We speak of a "kind" person, and we speak of "mankind," and perhaps, if we think about the matter at all, we seem to ourselves to be using quite different words, or the same word in senses quite unconnected, and having no bond between them. But they are connected, and that most closely; a "kind" person is a "kinned" person, one of kin; one who acknowledges and acts upon his kinship with other men, confesses that he owes to them, as of one blood with himself, the debt of love, and so man*kind* is man*kinned*.* In the word is contained a declaration of the relationship which exists between all the members of the human family, and seeing that this relationship in a race now scattered so widely and divided so far asunder can only be through a common head, we do in fact every time that we use the word "mankind" declare our faith in the one common descent of the whole race of man. And beautiful before, how much more beautiful now do the words "kind" and "kindness" appear, when we perceive the root out of which they grow; that they are the acknowledgment in deeds, of love of our kinship with our brethren, and how profitable to keep in mind the lively recognition of the bonds of blood, whether of those closer ones which unite us to

* Thus it is not a mere play upon words, but something much deeper, which Shakspeare puts into Hamlet's mouth; when speaking of his father's brother who had married his mother, he characterizes him as "A little more than *kin*, and less than *kind*."

that whom, by best right, we term our family, or those wider ones which knit us to the whole human family that this is the true source out of which all genuine love and affection must spring, for so much is affirmed in our daily, hourly use of the word.

And other words there are, having reference to the family and the relations of family life, which are not less full of teaching, which each may serve to remind of some duty. For example, "husband" is properly "houseband," the *band* and *bond* of the house, who shall bind and hold it togther. Thus, old Tusser in his *Points of Husbandry:*

> "The name of the *husband* what is it to say?
> Of wife and of *household* the *band* and the stay;"

so that the very name may put him in mind of his authority, and of that which he ought to be to all the members of the house. And the name "wife" has its lesson, too, although not so deep a one as the equivalent word in some other tongues. It belongs to the same family of words as "weave," "woof," "web," and the German "weben." It is a title given to her who is engaged at the web and woof, these having been the most ordinary branches of female industry, of wifely employment, when the language was forming; so that in the word itself is wrapped up a hint of earnest in-door-stay-at-home occupations, as being the fittest for her who bears this name.—[*Trench on the Study of Words.*

From the Rural American.

Applications of Manures.

A very fundamental principle in the application of manures is, that not only the kind and quantity, but the mode of their application should be adapted to the position, character and condition of the soil. This general principle in relation to the nutritive manures, may be reduced to a number of highly practical rules.

1st. The smaller the quantity of *organic* matter in the soil, the greater should be the quantity of manure applied, and vice versa.

A slight dressing of manure on an exhausted soil, and a heavy one on a soil already stored with nutritive matter, would be alike injurious; the former being insufficient not only to give a permanent fertility to the soil, but even to make the present crop a remunerating one, and the latter having no immediate office to perform, the crop to which it is given being already supplied with appropriate food.

2d. The heavier, damper, and colder the soil, the lighter, drier, and warmer should be the manure applied; as horse and sheep dung in an unfermented state.

"Animal manures develop more or less heat according to their nature and the state of fermentation; those which have been decomposed, excite more heat and maintain it for a longer time than others. The excrements of the sheep and horse are more heating in their action than those of the cow; the black or brown manures warm the soil more than marl or chalk."—Chaptal, p. 37.

3d. The lighter, drier, and warmer the soil, the heavier, damper, and less heating may be the manures applied.

The liability of the light soils to suffer from drought, should lead the farmer not only to exercise greater care in selecting the most suitable manures, but to see that they are *thoroughly incorporated* with the soil, and not left in masses, to increase the evil. Moderate quantities of either animal or vegetable matter, if properly blended with the soil, will promote its moisture by increasing its power of absorption; but if applied in excess, or left in considerable masses, the opposite effect will be produced.

The same considerations should have their weight in relation to the kind and quality of manure used, if any, in the hill for hoed crops.

4th. The more porous the soil, having a loose subsoil, the nearer the surface should the manures be deposited, to avoid infiltration. If on the other hand, by placing our manures too deep in the soil, we suffer from infiltrations, so on the other, by leaving them upon the surface, we shall find ourselves losers by evaporation, though, perhaps, to a less extent. The true practice would be to give them just that covering which, while it would protect them from the direct influence of the atmosphere, would not at the same time keep them longer within the reach of the roots of the plants.

5th. The more impervious the soil, having a compact subsoil, the deeper and more intimately *should the manures be incorporated*, to promote the freest action of the sun and air upon the soil, to render it easier of cultivation, to secure a wider range for the roots of the plants, and to prevent excessive moisture in wet, and drought in dry weather.

The common air, which is to a great extent excluded from soils of the kind now under consideration, exerts a most powerful agency in promoting vegetation, and that in various ways. To be convinced of the importance of permeability, and a looseness of texture to the soil, we need but reflect for a moment that plants are not permitted, like animals, to roam about in quest of their food, the invariable limits of their pasturage being the extremities of their roots. How obviously necessary, then, that they should be enabled to extend their roots with the utmost freedom, and thereby derive nourishment, without impediment, from those elements which can yield them sustenance.

"Whenever water is converted into steam, the ascending vapor carries off much of the heat along with it. Let two adjoining fields be wet or moist in different degrees, that which is wettest will almost at all times give off the largest quantity of vapor, and will therefore be the coldest.

"What is the remedy? Effectual drainage. The first effect on the soil is the same as if you were to place it in a warmer climate, and under a milder sky, where it could bring to maturity other fruits and yield more certain crops.—JOHNSTON, p. 74.

"If the water is withdrawn from a marsh, free access is given to the air, and the marsh becomes a fruitful meadow."—LIEBIG, p. 116.

"The solvent power of water over solid substances is increased by an elevation of temperature. To this fact is ascribed, among other causes, the peculiar character of the vegetable productions, as in tropical countries."—JOHNSTON, p. 48.

"Warmth renders the sap fluid, and quickens its circulation; cold thickens it, and renders it stagnant. It is heat alone that, by animating the vegetable organs, enables the plant to elaborate within itself the nourishment it receives."—CHAPTAL, p. 36 and 102. T.

From the American Agriculturist.

Gas-Lime—Experience in its Use—Valuable Information.

[The rapid introduction of gas into cities and villages, and the large amount of lime used in purifying the gas, which is offered to farmers at a cheap rate, makes the subject one of no little importance. The constant inquiries received, we have usually answered by forwarding a copy of the *Agriculturist*, Vol. XVII, No. 1, (Jan., 1858,) in which the subject is ably treated by Prof. Johnson, of the Yale Agricultural School. We can not better meet the demand for present information, than to republish Prof. Johnson's remarks; to which is also appended an account of some recent experiments by a subscriber in Dracut, Mass. —ED.]

LETTER FROM PROF. S. W. JOHNSON.

To the Editor of the American Agriculturist.

The various contradictory opinions held among practical farmers with reference to the value of gas lime, as a manure, are justified by the extreme variableness of its composition. When perfectly fresh from the gas-purifiers, it is in general a rather *dangerous* application to any growing crops, or in contact with seed. Mr. Solomon Mean, of New Haven, Ct., informs me that he once applied it in the hill to potatoes, and they never came up. A gentleman in Wallingford, Ct., applied it to grass land and to the roots of peach trees. The trees were destroyed, and the grass severely scorched, so that it did not fairly recover until the ensuing year.

It may be used in the fresh state upon naked fallows, especially when it is desirable to free the soil from slugs, injurious worms, or couch grass. What its action is upon vermin may be inferred from the fact, that when fresh, it contains a substance (sulphide of calcium) which is the actual ingredient in the depilatorics and cosmetics, which are articles employed for removing hair. There is an account of its being thrown into a hog-pen with the intent that the swine should incorporate it with the compost heap. This was effectually accomplished, but at the expense of the bristles and hair of the hogs, which were, in a great measure, removed by the operation.

It is thought, too, that the odor of the coal-tar which is mixed with the gas lime in greater or less quantity, serves to dislodge insects and vermin, and it is sometimes sowed in small quantity over young turnip plants to prevent the at-

tacks of the turnip-fly. In Scotland, it is largely applied to moss-land which it is intended to reclaim.

The quantity of easily soluble matters, (sulphide of calcium, sulphite and hyposulphite of lime,) is so variable, ranging according to analytical data, from 2½ to 15 parts in 100, that we may readily comprehend how some gas limes may be quite harmless if applied in moderate doses even to growing crops, while others, rich in these soluble and deletrious matters, destroy all vegetation.

It has been supposed that fresh gas lime is valuable on account of the *ammonia* it contains. When the gas-lime is emptied from the purifiers in which it has been exposed to the gas, it has quite a pungent odor of ammonia, but the quanty, though enough to affect the nostrils, is, in reality, quite too small to have any great manuring value, and entirely disappears after a few days' exposure to the air. Mr. Twing, of this Laboratory, found in a specimen of perfectly fresh gas-lime from the New Haven gas works, but 8-10ths of *one per cent* of ammonia. In a gas-lime from the gas-works at Waterbury, Ct., which had been exposed to the air for one week, he found but about 4-100 of *one per cent.*

Fresh gas-lime may be advantageously used in composting swamp muck, etc.

By full exposure to the atmosphere, as when scattered over fallow-ground, after a time it becomes innocuous. The soluble caustic ingredients are converted into no less valuable a substance than gypsum (plaster), and then, after its odor and bitter burning taste have disappeared, it acts precisely like a mixture of lime and gypsum. How rapidly these changes take place, I have no means of knowing without making actual trial, but should presume that if a dressing of gas-lime be incorporated thoroughly and uniformly with the soil *one week*, before sowing or planting, no harm could result to the crop. [*One month* would be safer.—Ed.]

In conclusion, your correspondent is recommended to use it, if he can get it more cheaply than other lime, at the rate of 50 bushels per acre on heavy soils —or 10 to 20 bushels on light soils—making one application in three or four years. If fresh, it should be put on the bare soil and not on a crop. In case of corn or potatoes, it may be scattered between the rows and worked in at hoeing time. If the gas-lime is white and tasteless after exposure to air for a time, it may be sown like gypsum.

It should be remembered that a wet soil will not be much benefited by lime, nor by any manure, unless in a dry season; and that a light dry soil is soon spoiled by lime unless a good supply of organic matter be maintained in it, by means of stable manure, muck composts, or green manuring. Lime, and plaster too, are, at the best, even when they exhibit their most extraordinary effects, but partial fertilizing agents. S. W. Johnson.

Experience with Gas Lime.

S. A. S., of Dracut, Mass., under date of Jan. 28, 1861, writes to the *American Agriculturist* thus: "....In the Spring of 1859 I bought two barrels of

gas-lime from the Lowell works, and tried a portion upon a row of early potatoes, beside another of the same kind without any gas-lime. One half of each row I set with sprouts. I could perceive no difference at digging, except that the sprouts were a little later than the rest. The gas-lime had no apparent effect. On the 7th of June of the same year, I scattered the remaining 4½ bushels broadcast, before plowing, upon ⅛ acre of potatoes on rather wet land, by the side of another ⅛ acre of land, a portion of which was, perhaps, a very little dryer. About a dozen hills came up on the gas-limed part, but these afterwards succumbed. Those without lime came up finely, progressed rapidly, and, with the exception of a few rows, gave a fair return, considering the late planting. The seed was a late variety. You wish us to give failures as well as successes. That was *my failure.*

Last Spring, a neighbor thought *he* would try it, as it only cost two cents a bushel; so he turned over his sod, and put from one to two quarts of the stuff in each hill, covered it slightly with dirt, and planted his potatoes. The corner where the gas-lime was buried could be easily distinguished a quarter of a mile off, it being perfectly bare. The potatoes are yet to appear above ground.

Again, in the Fall of 1859, having suffered some weeds to go to seed by the side of a wall, and seeing the effects of the gas-lime on my potatoes, I applied a barrel of it, fresh from the works upon about 800 square feet, and let it remain on the surface all Winter. Very early in the Spring I harrowed it in, then turned it under, and sowed rye for soiling. The rye appeared earlier, was of a deeper green, headed out five days sooner, and was six inches taller than that by its side not treated in this manner. I afterwards plowed again and put in corn fodder. The fodder was decidedly "yallar," though I was very sure I did *not* sow the yellow kind, and though it appeared earlier than the rest, it grew to *be only eight inches high!* There were but few weeds, however, on that part.

Again, I composted it with muck and horse manure, using lots of muck, and gave a liberal dressing to a plot where I wished to start cabbages for transplanting them, that where there was a lump of gas-lime and muck, the cabbage roots were woven round it, taking it up with them. (By the way, 250 plants which I *puddled* in a liquid of home-made guano never flagged, though the sun came out immediately after setting out; and moreover, they paid me twice over for my extra pains. I begin to see how valuable cabbages are for stock, now that the 2000 heads I raised between my early potatoes and peas are gone, and I only regret that I have not 2000 more.)

My experience with cut worms has not been quite as disastrous as some of your correspondents, thanks to hints from you. I *put in plenty of seed and to spare*, according to the advice of the *Agriculturist*, and at the first hoeing I kept a good watch for the cut worm, both where a spear was wilted, and everywhere else. Scarcely a hill did not have at least one. I searched till I found him if a stem was cut, and taking him on my hoe, with or without dirt, as it happened, and with the sole of my boot made him disgorge forcibly. I thought, as I

crushed each one, that *he*, at least, would neither trouble my corn again, *nor produce progeny for another year's supply*. They disappeared suddenly. Where they went to, or what form they assumed, I can not tell, but would much like to know.

My conclusions upon the subject of gas-lime I give for what they are worth, though being a novice, and my experiments imperfect, I speak with diffidence, yet hoping that my "one item," when taken in connection with others you receive, may be of use to you at some time, and consequently to myself. To cabbages and rye it *did seem* to be a benefit. Applied to corn in any manner, I have been informed, it is injurious, and I think it would be much the safest mode to compost it with a goodly quantity of muck, and perhaps muck and manure. In that manner it gave me the best returns. But whether its value, according to cost, is greater than stone lime, to compost with muck, of which I have an inexhaustible supply, I would much like to know.

Remarks.—A careful study of what Prof. Johnson says, will, in part, explain the results with J. A. S., and the contrary experiences of many others. The crude or fresh lime from the works is poisonous. After thorough composting with muck, or after sufficient exposure to the air, and especially to frosts, on the surface of fallow or plowed ground, it loses its noxious properties, and is then probably quite as valuable as common lime, owing to the amount of gympsum formed by its decomposition.—Ed.

From the American Farmer.

Dr. Baldwin's Shade Theory.

In a late number of the *American Farmer*, Dr. Baldwin has again appeared, and commenced his essay with this important query: "Can the fertility of cultivated land be preserved without the application of manure?" In appearing to discuss this "very interesting question," the Doctor, after stating the fact and producing other evidence to show what we all know as a general thing, that "the longer the soil has been subject to cultivation, the poorer it has become," he asks, "is there no remedy for this alarming and steadily progressing evil?" and then slips in his favorite theory of shade, without giving his own experience to confirm it, by saying, "I have asserted that all soils, no matter how poor or by what process exhausted, may be made exceeding fertile by covering the surface with any substance whatever which will cause a dense and permanent shade, and that the degree of this fertility is totally independent of the quality of the covering substance." Here, then, we have the important fact in full—so how do ye "intelligent farmers," who "do not care to understand the quo modo," and are "perfectly satisfied with the knowledge of the facts," and reverently acknowledge the influence of shade, without presuming to enquire whether the Doctor's practice corresponds with his theory.

But to be serious—does Dr. Baldwin's practice in farming correspond with his theory? Has he made his own farm, situated as it is in that "valley so celc-

brated for the fertility of its soil," "exceedingly fertile"? I have no personal acquaintance with the Doctor, nor his farming operations, but if he is not misrepresented by his neighbors, his farm is not superior to many others in that valley. His plan of shading I understand to be this: he gets as good a stand of clover as he can, then lets it grow until it is as large as it will get that season, then turns not only all his own stock, but all he can get of his neighbors for a while into it, and treads it down as quickly as possible, then lets it lie in this state. Where is the difference, in effect, in this plan, from that practiced in many places where they have depended on "a crop of clover, or peas," as a green crop for improving the soil? The Doctor admits that "the fertility imparted to the earth, by a growth of vegetable substances of various kinds, has been known to observant practical farmers for centuries," and yet he concludes "that the interests of agriculture has not been greatly promoded by the knowledge of facts of such great importance to the farmers." Are we to conclude that the use of green crops and the grasses have been of no "great importance" to our agriculture in the last three-fourths of a century? What would have been the condition of our soil now without their use? The reason why "the interests of agriculture" have not been more "promoted hitherto by the knowledge of facts of such great importance," in his opinion, "admits of no other explanation than that it was impossible to deduce a scientific principle from isolated facts." How did Dr. Baldwin himself come to a knowledge of the "scientific principle" he so much values, but by studying isolated facts." He has, in former essays, brought forward "isolated facts" to prove his conclusions, and facts, too, that would admit of a much more philosophical interpretation than the one he gave them, and yet he strongly intimates that "scientific agriculturists" of former days could not "deduce a scientific principle from isolated facts." He has denied that science, as has been applied, has benefited agriculture, and yet he considers that his scientific view of the subject is of great importance to the farmer. This scientific view, if I understand it, is that shade causes the earth to putrify, and thus enrich itself. That the organic matters in the soil do putrify, or more properly decompose, has long been acknowledged by agriculturists and scientific men, hence the great value of green crops to the soil; but that the inorganic matters of the soil do purify, has been denied, and is denied, and Dr. Baldwin has never attempted to prove it, as far as I know. That these matters decompose and thus furnish nutrition to vegetables, is evident from the fact of their presence in vegetables, and that this decomposition is provided by the presence of organic matter in the soil, is also evident.

There is another vague idea suggested in this essay, to account for the fertility of soil from shade, and that is "the generation of myriads of invisible animalcalæ." Now, that he could know that they were "animalculæ," if they were "invisible," is a mystery to me; perhaps he can enlighten us, and instruct us how to ascertain the nature of "invisible" things. "Science, I understand," says he, "to be the knowledge of principles derived from facts." True—but it

is not all who observe facts that deduce correct principles from them. How often do we see facts brought forward in support of theories that have no foundation in true science. Very much of this class are the conclusions of the Doctor against the use of barn-yard manure. Because the farmer "has never been able to obtain an adequate supply," he asks, "why should the farmer bestow so much attention and labor upon the collection or materials in his barn-yard," &c. "Why should he purchase it if it be not indispensable? Or why should the slow, laborious, and expensive process of liming be so urgently commended to his attention? I certainly cannot comprehend; if any satisfactory reasons can be assigned, I shall be pleased to learn them." Is it any argument against the use of barn-yard manure that the farmer cannot make as much as he needs? Even the Doctor knows that it is valuable; whether it is more expensive than shade has not been shown, and until that is proven, he must excuse others if they do not agree with him. Now what we ask of the Doctor is, to show from facts—for facts are wanted—that the process of shade is cheaper than other manure, and his brother farmers will have good sense enough to follow him. Let him take his own farm, give the number of fields, the rotation practiced, how long his land was shaded, how much per acre was produced before and how much increase by shade. Let him present this by figures, and give a fair account, charging interest for capital, and see then where his balance would be. It should be remembered that the Doctor has a profession in addition to the profits of his farm, which other farmers have not, and that he might be able to do without any produce from his land for the time necessary to be left shaded, while a man with a small farm and large family, could not so well do so. Until he shows that a man of moderate means and a small farm can improve his land cheaper by shade than in any other way, practical men will not give their assent to his shade theory.

YARDLEY TAYLOR.

From the Farmer and Gardner.

Plain Talk about Draining.

MR. EDITOR:—A word on the subject of underdraining. I am aware that the subject has been presented in a thousand forms, by as many able writers, but still we do not, as a people, appear to have profited by the teachings.

The experience of practical drainers, both in our own and other countries, proves beyond all controversy, the immense advantages which accrue from the thorough draining of *all* soils. Some idea of the estimate of value placed upon it by the Parliament of England, may be found in the fact, that that body set apart two millions of pounds sterling to be loaned out for the encouragement and extension of draining, and the results flowing from this wise legislation, have been of the most gratifying character. It is, I am aware, a difficult matter for the merely practical farmer to understand fully, how, what are known as warm, dry soils, can possibly be benefitted by draining. Many would take the opposite view, and, instead of draining, endeavor to *supply* the supposed needed moisture.

A recent writer says, "they imagine that such soils are deficient in moisture, and cannot comprehend how the moisture which they lack in summer, would flow *up* through the open and friable soils from below, while the surface supply, when superabundant, would rapidly percolate through to the drains, leaving in its passage, certain necessary constituents, and making way for the air, with its oxygen and carbon, and such ammoniacal matters as it may be charged with."

SOME OF ITS EFFECTS.

It is only a few months since I had the pleasure of examining a thoroughly drained farm in an adjoining county. Had I required any evidence to convince me of the immense advantages of draining, I would have found it there. The superior crop of corn, the luxuriant grass, even at that late season, (October,) and the flattering accounts of the gathered crops, all told a tale which carried its own moral. A remarkably handsome meadow was pointed out to me, in which cattle were grazing, and over any portion of which a heavily loaded wagon could pass with entire safety. That meadow only a few years since was little less than an unsightly bog. Its spirited owner had *drained it thoroughly*, and he now regards it as one of the most valuable portions of his beautiful farm.

Nothing short of an investigation of the unmeasured advantages which are certain to follow systematic draining, will enable farmers generally, to appreciate the incalculable advantages which flow from it. Another writer on the subject says, "a superabundance of water on the surface of fens, bogs and marshes, is so obvious a cause of great and manifold evils, as not to require explanation; yet it operates in many respects quite as leniently as *an excess of moisture in the cultivated lands of peopled districts.*

THE EVILS OF UNDRAINED SOILS.

It should, therefore, be a subject of early and thorough investigation with every farmer who seeks to improve his lands, and until it is generally practised in our country, we can never hope to reach an elevated position as an agricultural people. I cannot here forbear quoting from a very able writer on this subject: "The water which is retained under the soil on impervious layers of earth effects incalculable mischief. While hidden water remains, manures, whether putrescent or caustic, can impart no fertility to the soil, the plow, the harrow, and even the roller cannot pulverize it into a fine mould; the grass can contain no nutriment for live stock, as the finer sorts disappear, and their places are usurped by coarse aquatic plants; the stock can never receive a hearty meal of grass or straw from land in such a state; they are always hungry and dissatisfied, and of course, remain in low condition; the trees acquire a hard bark and stiffened branches, and soon become prey to innumerable parasites; the roads in the neighborhood are constantly soft and rutted; the ditches and furrows are either plashy, or like a sponge, full of water, suitable receptacles for toads and frogs. The surrounding air is always damp and chilly, and from early autumn till late spring, the raw hoar frost meets the face like a wet cloth, morning and

evening. In winter the frost incrusts every furrow and plant with ice, not strong enough to bear one's weight, but just weak enough to give way at every step, fit feeding ground for woodcock and snipe, and in summer, musquitoes, green flies, midges, gnats and gad-flies torment the cattle, the laborer and his horses from morning till night, while the sheep get scalded heads and are eaten up by maggots during the hot blinks of sunshine.

This is a horrible picture to be sure. The catalogue of evils presented is a formidable one, and yet not one-half of the calamities which follow the want of draining have been enumerated.

Were it possible, within the narrow limits of a communication, to point out the ill effects of badly drained lands upon crops, I feel satisfied it would be an easy task to convince most of your readers, that very many of our failures to secure remunerative crops, are attributable, not, as is frequently charged, to the weather, or to the poverty of the soil, or to careless tillage, so much as to the want of proper underdraining. Who has not heard of spouty lands? What are they? Simply, lands which, if the superabundant moisture were carried off by properly constructed drains, would become as valuable as any other portion of our soil.

It will, perhaps, be urged that the cost of underdraining is so great, that few farmers have the means or the inclination to undertake it. This is precisely the failing which pervaded the English landholders, when the conviction was forced home upon them, that thorough, systematic and scientific underdraining was the only remedy for the difficulties under which they labored. A few strong hearted, determined men, resolved to test the experiment fully, and when they demonstrated not only the entire success of the experiment, but also that large profits attended it, others were soon found who followed their example, and to-day the benefits are seen in the luxuriant crops of that country.

HOW IT PAYS.

I have never known a single instance of proper draining which has not paid well. It is only the first outlay which frightens. The increased crops, the greater ease with which well drained lands are cultivated, the decidedly greater certainty of good crops one year with another, all pay so large a dividend upon the capital invested, that in a few years the entire cost of the draining is met in this way. Suppose it does cost seventy dollars to properly underdrain an acre of land! The interest of that sum is four dollars and twenty cents. Now, I contend that if underdraining is worth anything at all, it ought to produce a greater increase of crop, than would amount to four dollars and twenty cents per acre. But this is an extreme sum. The majority of our lands could be drained for half that sum, and even less, and all will admit that it is far better to have an investment of this kind, than in the uncertainties of bank and railroad stock, with defaulting cashiers and treasurers, and who, with almost every depression of business, make an excuse for not paying their honest dues.

HOW IT IMPROVES THE MARKET VALUE.

But it is not an investment depending upon the increased crops as the only

remuneration. Let us take any farm in Montgomery county, which to day is worth $100 per acre, and which *undrained* will yield an average of twenty bushels of wheat to the acre. Drain that same farm thoroughly, so that its average yield with the same cultivation will be thirty, instead of twenty. It does not require a great deal of figuring to tell how much more the well drained farm would have done, had it been offered for sale before being underdrained. It is in this light we must examine this great question of drainage. I say *great* question, Mr. Editor, because I consider the subject one of the most vital importance; one which sooner or later *must and will* be the leading one with the farmers of the United States.

WHAT ARE ITS GREAT RESULTS.

When thorough drainage shall have assumed its proper position, we may then look forward to the following results with entire confidence. *First*, we shall be relieved of all excess of moisture from heavy rains; *Second*, the ascent of water from beneath, whether by capillary attraction or by the force of springs, will be arrested. *Third*, the water from heavy rains, which on undrained lands either saturates the soil, and is retained by it, or passes over it, conveying with it many of the fertilizing constituents of that soil is, on drained land, filtered through it, imparting to the soil those substances useful to vegetation, which rain-water is known to possess. *Fourth*, the constant or even periodical descent of rain-water through drained soil, carries with it a supply of fresh air which displaces the air in the pores of the soil. As the water gradually sinks, leaving the pores of the soil open, the fresh air follows and supplies the place of the less pure air which was expelled by the water. This fresh air has been shown by the most ample experience, to be immensely valuable in promoting the healthy growth of all cultivated crops. *Fifth*, the temperature of the soil is considerably raised by it; in fact the change in this respect which thorough drainage effects, is almost equivalent to a change of climate. Consequently, crops arrive at maturity much earlier than without, a subject of the highest importance as every farmer knows. *Sixth*, being forced from the constant presence of undue quantities of water, the soil becomes drier, sweeter, more easily, and consequently, more economically worked; and *lastly*, the superabundant water being rapidly carried off by efficient drainage, the putting in of crops, (particularly of winter grains,) is not retarded until, as is so frequently the case on undrained lands, the seeding time is protracted to so late a day as to render ripening also late, thus subjecting the farmer to the risk, loss from mildew, waste, &c.

These, Mr. Editor, are some of the advantages which men, who have given the subject of thorough drainage their closest attention, claim for it, and they are sanctioned by all experience and sustained by every principal of science.

Montgomery Co., Pa. DRAIN TILE.

STOMACH BITTERS.—Infusion of columbo, infusion of cascarilla, of each four ounces; carbonate of potash, one and a half drachm.

Professor Campbell's Address.

[At a regular monthly meeting of the Rockbridge Agricultural and Mechanical Society, held at the office of the Treasurer, on the 16th of March, 1861, Professor J. L. Campbell, in fulfilment of a previous appointment, delivered an address, of which we find in the Lexington Gazette the following:]

Outline of Prof. Campbell's Remarks.

By previous appointment, Prof. Campbell addressed the meeting, in substance as follows:

He said he had not come prepared to make a set speech or a formal lecture; but simply to give an off-hand talk, on the first topic selected for the present discussion. He had proposed the topic himself, and had intentionally placed plowing before manuring corn land, because he believed that plowing ought always to precede manuring, in the preparation of ground for a corn crop; the reasons for which opinion would appear in a subsequent part of his remarks.

As to the condition of lands best fitting them for the successful cultivation of corn in this limestone Valley, there could be but little difference of opinion. It was not worth while to tell a company of intelligent practical farmers, that a grass or clover sod turned down presented the surest chance for a fair crop. On such lands, he contended, that manuring might precede plowing; but not as a direct application just previous to planting. He favored the plan of applying manure to the grass or clover crop of the previous season, on the ground that the fertilizing properties of the manure would be transferred to the clover; and besides this, the clover crop, during its growth, would collect from the air and soil large quantities of organic and mineral matter, which, together with what had been obtained from the manure, would make a mass of fertilizing substances in the soil, greater than the clover could have given without the manure, and even greater than the manure and clover both would have given if they had been applied separately—the manure having increased the value of the clover crop to an amount, even exceeding its own original value.

The question of *the importance of deep plowing* for corn, (he remarked,) is fully settled, to the entire satisfaction of every well-informed farmer. That is no longer a point to be discussed. The questions now are, *first*, how to induce farmers to put their own faith into successful practice; and, *secondly*, how this practice can be conducted most economically and successfully in our stiff limestone clays. On the first of these questions practical men can be induced to act, when they are convinced that they can cultivate a smaller quantity of land more thoroughly, and make it yield as much as the larger quantities, which they now cultivate only superficially. This can be most effectually done by actual experiments, some of which will be given presently.

As to the best means of getting our soils broken to a sufficient depth, there may be differences of opinion; and as to what is a sufficient depth, men may not agree; but no one ought to be satisfied until he has gotten at least 15 inches of his land well pulverized. This cannot easily be done with the ordinary mould-

board plow, nor would it be desirable to have it thus accomplished—at least in a single plowing; for too much of the stiff clay would thus be brought to the surface, and form a tenacious mass, which would be converted in a hard, unyielding crust by every heavy rain. The *temporary* injury done to crops, by thus turning up the sub-soil, has stood in the way of deep culture, more than any one thing else.

The objection just mentioned may be most successfully obviated by the use of the *sub-soil plow*. Following in the furrow of the ordinary plow, it breaks up the clayey sub-soil, pulverizing it with the coulter and share, but leaves it in the bottom of the furrow, to be covered again at the next round of the other plow. This process will bring a field into the condition of having a deeply broken surface, with the top-soil still uppermost.

The advantages of having land treated in this way, may be briefly detailed.

1. It ultimately results in the formation of a deeper soil. The sub-soil always contains, in such lands as we have to deal with, a good supply of mineral fertilizers, and all it wants to make it as good, and often better than the surface soil, is a supply of decayed vegetable matter. When it has been thoroughly broken, it will soon be penetrated by the roots of crops, (especially clover); these by their decay, gradually fill the lower stratum of soil, to which they have been admitted, with humus or vegetable mould, and thus fit it for being brought to the surface when wanted there.

2. A larger space is given to the growing crop, from which to collect its necessary nourishment. The roots of corn penetrate to a depth, limited only by the depth to which the plow has run. [To illustrate this point, the speaker mentioned a case in which he had traced corn roots to the depth of five feet, in a porous and very fertile piece of ground, on the margin of a stream. He also stated that he had found clover roots in similar situations, penetrating to a perpendicular depth of more than three feet.] In such case, the top of the plant was found to correspond, in the luxuriance of its growth, to the length of the root.

3d. Sub-soiling is an *antidote to drought*. A deeply broken soil is capable of absorbing an amount of moisture proportioned to its depth. Every one knows that most of the rain which falls upon a beaten road runs off, and the surface becomes dry and hard in a very short time in Summer. Water cannot easily penetrate firm clay, and the little that gets into it is soon sent to the surface, and evaporated. So the unbroken sub-soil of a field cannot at any time contain a large quantity of moisture. But if it is well pulverized, it receives and retains water in abundance, and as the surface-soil becomes dry, this water rises, by what is called "capillary attraction," and thus supplies the higher, as well as the lower roots, with whatever fertilizing substances it holds in solution.

4. A deep mass of broken soil is not so liable to be washed into gullys as one which is more shallow. The rain, instead of running off and carrying off the

soil with it, is absorbed and retained, unless it is very heavy and long continued. Thus sub-soiling tends to prevent washing.

After giving this out-line of the general principles involved in deep plowing, the speaker remarked, that he believed the result of actual experiment would have far more weight with the minds of practical men, than all the theoretical considerations that could be presented. He would, therefore, venture to give one or two experiments of his own, conducted on a limited scale, but not the less truly illustrating the principles he had just been discussing.

The first was a trial of sub-soil plow on corn stubble, broken up in the Spring, to be again planted in corn. The land lay upon the shaly limestones of the Poplar Hills. In consequence of lying idle for several years, the field had become foul with briars and locust sprouts, and required two years tillage in corn to subdue it entirely. In preparing the ground the second year, he sub-soiled a portion of it to a depth of 10 or 12 inches; the remainder was plowed in the ordinary way. The soil on the sub-soiled portion was in no respect superior to that of the other part. The stalks of corn grew well on both, and in that respect no very marked difference was perceptible. But the earing season was dry; and whilst the blades were quite green and fresh where the sub-soil plow had been used, they were considerably fired on the other portion of the field, as well as on neighboring fields. The most marked difference, however, was developed when the crop was gathered. The sub-soiling gave a difference of fully *seven bushels* per acre in its favor. When gathered, a part of the crop was sold immediately at 62½ cents per bushel. This would make $4.37½ per acre for the extra plowing, while the actual cost was not more than $2.50.

Another experiment, conducted somewhat differently, was made upon a part of the grounds of Washington College. The old commons, which had been in pasture probably 40 years or more, had been recently put under cultivation. On that portion referred to by the speaker, a blue-grass sod was turned down during the Winter, and a heavy harrow passed over it, so as to press it down, and conceal the grass as far as possible. Thus it lay, exposed to frosts and rains, until the last week of April. Just before planting, a sub-soil plow consisting of a very sharp coulter about fifteen inches long, armed with a share at the bottom, was run diagonally across the lot, so as to cut the original furrow neither longitudinally, nor at right angles, but obliquely. In this way the sod was cut into fragments, without being torn up from its inverted position. The plow went to the depth of about 12 inches, (when not prevented by rock,) giving a fine pulverized condition on the surface, and breaking, at the same time, at least 4 or 5 inches of sub-soil, which the plowing had not touched.

Besides the usual benefits of sub-soiling, this plan had the additional advantage of loosing the sub-soil, just before planting time, at the same time having all the benefit of frost upon the sod inverted in water. The grass was then well rotted, before the corn had made much progress in its growth.

The whole lot was treated alike, and hence no decided comparison could be

instituted, so as to draw a definite conclusion as to the benefit derived from the extra treatment of the land; but during the month of August, when neighboring lots were suffering greatly from drought, the corn on this one retained all its freshness and vigor. The crop yielded between 44 and 45 bushels per acre, while a large part of the soil is not remarkably fertile, a considerable part is rocky, and no part very favorable for bearing a severe drought.

After answering a number of questions, asked by gentlemen present, on the subject of plowing, the speaker took up the subject of manuring land for corn.

Both experiments and scientific investigations concur in condemning the old method of spreading manure upon unbroken land, and then turning it down with the plow. The idea that manure loses much of its virtue by evaporation, when exposed upon the surface of the soil, is an exploded fallacy. Ammonia is the only very valuable ingredient of manure which is volatile. This is only liberated, or rather, generated during the fermentation or decay of organic manures. The fermentation can take place rapidiy, only when the material is thrown into heaps. Then, if a sufficient quantity of moisture is present, nearly all the ammonia will be retained, either by the water or by vegetable acids formed in the manure heaps, at the same time with the ammonia. The case is different, if the mass is sufficiently dry to form a white mould within. To this process the term "fire-fang" has been applied. It results in serious injury to manure heaps, and is more frequently seen in the cleanings of stables than elsewhere.

More serious loss is sustained from the drenching of manures by rain than from all other causes combined. This is especially true in farm yards. Hence the importance of getting the material spread upon the land as soon as possible. Then the soluble matter, which is always the most valuable, is carried at once into the soil where it will be ready for the succeeding crop.

To the question: "Is it not best to have manure well rotted before it is applied?" he replied, that this was best; provided the rotting process could be conducted without the loss resulting from exposure to rains. Vegetable and animal substances are not in a condition to nourish until they have undergone decay. If this necessary process has been conducted in tanks and cellars, properly constructed, the manure will act more promptly than it would if allowed to go through the process of more slow decay upon the surface of the land.

He advocated the plan of spreading manure upon grass or clover, or upon freshly broken corn lands, as soon as possible, after it accumulates about stables and barn-yards. This was regarded as the most economical way of securing it against loss. The reasons in favor of this method have been given in part. In addition to what has been already stated, it will be readily seen, that whilst manure applied as a top-dressing loses but little of its fertilizing value, its soluble portions will be carried down by the rains that fall upon it, and be more completely mingled with the soil than could be done by any mechanical means. If spread upon grasses and clover, it would find its way at once at the roots of these crops; if applied to a field broken up for corn, it would be diffused through the

soil, where it would be formed by the corn roots at every stage of their growth. The insoluble portions are gradually incorporated with the soil in working the crop. The tendency of the manure in a soluble condition, is generally *downward*, and if already turned down to the bottom of the furrow, it can produce but little influence upon the crop, until the roots have penetrated to a depth of several inches.

The question was asked, "whether any thing but water is evaporated from manure spread upon the surface, and exposed to the hot sun?" To this the reply was made, that minute portions of carbonate of ammonia might escape at first, if the manure were spread out in a fermenting condition; but the loss thus sustained would be far less than would have resulted from the continued fermentation in the heap. So far as the mere dying of the manure is concerned, it amounts to nothing more than the evaporation of *water*, and results in no appreciable injury to its value.

"How would you apply *plaster and ashes* to corn?" was a question propounded. The general principle stated in reply was, that all kinds of fertilizers should be brought within reach of the corn roots as soon as possible. Hence he preferred applying these substances in the hill, and covering them with the corn.

In conclusion, the great error into which our farmers fall, is that of attempting to cultivate *too much land*. They have a certain amount of capital invested in their farms, and in their eagerness to make it all productive, with limited force, they diffuse their labor and manure over too many acres—more than they can till thoroughly—more than they can manure sufficiently to secure what may be regarded as a liberal crop. If the farmer has not force sufficient to cultivate all his arable land *thoroughly*, he had better put all his surplus acres under grass, else sell a part of his farm and invest the proceeds in some form which will be safe and productive, while he concentrates his energies within a more limited area.

From the Gazette.

ROCK RETREAT, March 16th, 1861.

To the President of the Rockbridge Agri'l and Mechanical Society:

DEAR SIR—I see by a notice in the Lexington Gazette, my name associated with other gentlemen as a co-editor of the Agricultural Department of the Gazette. I see by the same notice it will be my duty as well as privilege to attend the monthly meetings of the Board. I hope I shall be able generally to attend these meetings and contribute my mite to the furtherance of the noble cause of Agriculture. To-day, however, I am compelled by important business to be absent from your meeting. In tendering this excuse for absence, I deem it not inappropriate, by way of showing my appreciation of the object you have in view, to give you a few hints upon one of the topics proposed for discussion at this meeting—viz: the best time for turning stock on grass in the spring.

As the time is now approaching when this question will be of practical im-

portance, I will give a brief chapter of my own experience, confining my remarks to clover pasture. And, first, as to the interest of the clover itself. Stock ought never to be turned on a clover field, until the clover begins to bloom, which in ordinary seasons is from the 5th to the 10th of May. If clover is pastured sooner than this, it prevents it from making a luxuriant growth, and it is so soft and watery, it does stock but little good—on the contrary, it is liable to give them the scours; and if you take them off for a few hours, they will look as flat-sided as shad; showing that there is but little real substance in it at this stage of its growth. It is much better every way to feed stock a few days later in the spring than to turn them on clover before it begins to bloom. It is not necessary to wait till it blooms out fully or even generally, but only till it *begins to bloom.*

Now, as regards the safety of the stock, every farmer knows that *many* cattle are lost every spring by improper management in turning them on clover. They ought not to be turned on with an entirely empty stomach, or if they are, it should be but for a very short time at first, say 15 or 20 minutes, if the clover is rank, and then they ought to have plenty of salt.

Cattle ought never to be turned on clover, at first, in the morning, while the dew is on. The dew, combined with the sap of the clover, form a gas in the stomach of the animal, that swells it to such a degree as to cause his death very soon. In former years I lost one or more every year or two, and they invariably died in the forenoon. I never had one to die from this cause after 12 o'clock; they were always dead by 9 or 10, A. M., and swelled almost to the bursting point. My plan of management is this: I turn on the first time in the evening, and let them get a moderate mess. After a day or two I turn in twice a day, but not till the dew is off, and each time let them stay a little longer, and at night I turn into the barn-yard and give them some hay or straw, or something of the kind. This, I find is of great benefit to them at this time. This plan of turning on for a short time should be kept up from 4 to 8 days, according to circumstances.

The above is at your service. If you think it worthy of being read before the meeting to-night, read it; if not, just cast it aside,

And oblige yours, very respectfully, &c.,

ROBERT MORRISON.

"Nothing to Live for."

SAY you so, young man? Shame on your manhood for uttering such a sentiment! You have been disappointed, perhaps, in the attachment of an object on which you have foolishly set your heart—some "wee bit lassie," as Burns has it, whom you would clasp in your arms, were it not for fear of "mussing the dry goods up," has led you a willing captive to the charms of her beauty, and because she wearied of too easy conquest, and broke the chain that bound her to you that she might go forth, like Alexander, to subdue other kingdoms, you set tamely down and bemoan your hard fate as if you were the greatest martyr since

Nero's time! "Nothing to live for!" I blush for your willfull blindness. Arise and use the eyes that God has given for some useful purpose, and you will see misery enough in the world—real, genuine misery—to make you ashamed of the selfish Byronic sentiment which now unmans you. "Rouse to some work of high and holy love;" take your handkerchief down from your eyes, and use it to wipe away the tears of those who have some cause to be unhappy, and you will be surprised to find that your heart is still worth two or three broken ones. "Nothing to live for!" why, man, has all generous feeling left you, that you can look unmoved on the thousands of suffering ones needing your help, and go on your own lonely way, murmuring fretfully about the "desert sands," while you systematically avoid every oasis to which you might guide the bleeding feet of many a wayworn traveler?

There is work enough in life to awaken your greatest endeavor—work, too, so high and holy that it would not disgrace the highest archangel in the courts of heaven. Work valiantly, then, with tongue and pen, in the cause of human freedom; be ready and willing to give up everything—wealth, and honor, and good report, and life itself, if need be—for the good of your fellow-man groaning under the burden of oppression. Intemperance is slaying its tens of thousands on every hand; try what your arm can do to stay its ravages. Don't be content with saying, "God help the poor!" do it yourself. Some of your dainty, refined sentimentalism would be shocked out of you, if you could hear the plain, unvarnished tale of privation and sorrow which many a poor laborer could relate to you—a tale, perchance, of the gradual fading away of a beloved wife or daughter, till the cheek and lip which once rivaled the June rosebud are pale as the last autumn flowers, and hope and strength die out of the heart. Yet, without even asking if these things are so, you are doing nothing—absolutely nothing—except to breathe your life away in sighs and lamentations over disappointments, under which it is not the part of true manliness to falter for a moment.—*Life Illustrated.*

Soluble Phosphated Peruvian Guano.

ALEXANDRIA, VA., Feb. 15, 1861.

To the Editors of the Southern Planter:

MESSRS. EDITORS:—The December (1860) number of the American Farmer contained an able and interesting communication, from Prof. Campbell Morfit, of New York, on the subject of "Sombrero Guano and other commercial varieties of Phosphate of Lime, and in reference to their capacity for manipulating and superphosphating." In that communication Prof. Morfit exhibited two tables, Nos. 3 and 4, the former giving the results of his analysis of three "representative samples of certain manipulated Guanos, containing *Navaza Guano* as their phosphatic material in chief," and the latter, (table No. 4), showing "the analytical results from two fertilizers, made with care in the selection of all the materials, the phosphatic element being Sombrero Guano."

Prof. Morfit designates these two fertilizers as "A and B," with the explanation that "A" is a "*soluble* Phospho-Peruvian fertilizer," while "B" is a "manipulated Guano." After giving the respective analysis of "A and B," side by side, he proceeds to state that—"The poverty and objectionable features of the Navaza mixtures are seen in 1, 2 and 3, of table No. 3, as compared with the results in *A* and *B*, of table 4, from Sombrero Guano. No other phosphatic material than the Sombrero could be made to yield a fertilizer like *A* of table 4, *so affluent and yet so well adjusted in all the elements for profitable fertilization:* while, the employment of Sombrero in *B* gives also as rich a "*Manipulated Guano*" as can be probably made at the price charged for it by the vender."

Whilst we prefer to see the reputation of our "Soluble Phosphated Peruvian Guano" established, rather by the successful results *of its application to the soil* —this being in our opinion the surest *practical* evidence of its value—than any analysis whatever, we nevertheless frankly acknowledge feeling a proper degree of pleasure and satisfaction at the high estimate placed upon our fertilizer, by a gentleman so reliable and of such eminence in his profession as Dr. Morfit.

Although we have privately informed some of our friends of the value placed upon our fertilizer, (as compared with other manipulations) by Prof. Morfit, it was not our intention at this time, and *in this manner*, to remove the veil of secrecy, which he had with so much delicacy and propriety of feeling, dropped between the public and the proprietors of the different manipulations exhibited by him. Preferring rather that *practical results* should first prove the truth of his remarks, before connecting them publicly with our fertilizer. But we are reluctantly forced to do so, in consequence of a *change of title* in one of the manipulations *made since the publication of Dr. Morfit's* article, which is calculated to deceive (unintentionally no doubt) the public.

We beg therefore to state that *analysis "A" of "table No. 4" corresponds exactly with Prof. Morfit's analysis of our "Soluble Phosphated Peruvian Guano,"* and that analysis "*B*" of said table also corresponds with his analysis of Messrs. John S. Reese & Co.'s "Phospho-Peruvian (or Manipulated) Guano," as published by themselves.

We are with great respect, your friends and servants, FOWLE & CO.

Increase of Southern Productions.

A New York contemporary speaks of the rapid strides which the Southern States have made in Agricultural progress during the last ten years, as the next census will undoubtedly show. In support of this view, it says:

In the article of Cotton alone they produced, during the past year, over three million seven hundred and fifty thousand bales, which, at an average of fifty dollars per bale, amounts to the sum of one hundred and eighty-seven million, five hundred thousand dollars. Of this the American manufacturers have taken over seven hundred and fifty thousand bales, of the value of about thirty-seven

million, five hundred thousand dollars, and Europe has taken three million bales, valued at one hundred and fifty million dollars If to this export of one hundred and fifty million dollars in Cotton, we add the exports of the fiscal year ending June 30, 1849, at the same figures they stood at in the official report made up to the same time last year, though they probably have been nearly twenty-five per cent. larger, we shall find that the exportable value of Southern products will stand as follows:

	Quantity.	*Value.*
Cotton, bales, to Sept. 1, 1859,	3,000,000	$150,000,000
Tobacco, hhds., to June 30, '58,	137,670	16,500,000
Rice, tierces, " "	64,015	1,870,578
" barrels, " "	49,263	
Naval stores, rosin and tur., bbls.	578,573	1,564,578
" tar and pich, "	42,475	
Total,		$169,935,156

Seed Corn.

HOW TO PRODUCE EARLY GERMINATION.

If you did not, as you have so often been advised to do, save your seed corn by selecting the best ears in the field, don't lose another day, but go at once to your corn-cribs and pick out the handsomest ears that you can find, and store them up in some dry loft—no matter if it is a very smoky one, and as hot as a July sun; it won't hurt the vitality of the seed.

It is of the highest importance that your seed should germinate immediately after you plant it. That is of more importance than early planting. Germination can undoubtedly be hastened by artificial means. Dr. Chamberlin, of Bureau county, Ill., has made some important discoveries in this direction. The Republican says:

"Last year, Dr. Chamberlin, of this place, made some practical experiments, and demonstrated that nearly half the time may be saved in germinating the seed by the use of chloride of lime. Not satisfied with the success of last year, he is again experimenting. In his office he has four boxes; in the first is corn planted without soaking, and the seed not germinated; in the second, the seed was soaked in warm water, which has just commenced to germinate; in the third is seed soaked in a solution of lime, and green blades are just peeping from the ground; in the fourth is seed soaked in a solution of chloride of lime and copperas, in equal parts, and the blades are now nearly three inches above the ground. All the seeds were planted at the same time, in the same quality of soil, and taken from the same ear. The boxes have all had an equal share of heat and light, neither allowed advantage over the other.

"This experiment should attract the attention of farmers. We conclude from four to six weeks may be saved by the use of chloride of lime and copperas, which is a matter of no ordinary moment, when we reflect that a delay of germination of the seed of two weeks frequently places the crop within the

reach of the frost in the fall. Another fact of some importance may also be mentioned: The copperas used in soaking will pevent the birds, squirrels, worms, &c., from eating the seed.

"Dr. Chamberlin assures us that one pound of chloride of lime and one pound of copperas, in water, will soak enough seed for twenty acres. The cost will not be over twentyfive cents. Every farmer could afford to make the experiment, even if he should fail to derive any benefit from it.—*N. Y. Tribune.*

Sleeping Rooms.

The air which passes out of the lungs is wholly innutritious. If re-breathed without any admixture of other air, it would induce instant suffocation. It contains a large amount of carbonic acid gas. This gas is condensed by cold, and falls to the floor; heat carries it to the ceiling; hence the practical fact, that in warm weather, those who sleep on the floor, breathe the purest air; while in very cold weather the higher one sleeps above the floor, the better is the atmosphere. Hence in a warm room, sleep as near the floor as possible; in a cold room, the higher the bed is, the better. A striking illustration of one branch of the statement is found in Dr. Hall's new book on Sleep. When the jail-fever was raging in England, it was the custom to hand the food and water through a hole in the floor above them. A case is mentioned where the jailor and his wife died in one night, in consequence of the effluvia of the prisoner's cells below; while the prisoners themselves continued to live, showing conclusively the concentrated malignity of the air at the ceiling, as compared with that on the floor.

The same principle has an illustration in the narration in the same pages, of the terrible incidents in connection with the "Black Hole of Calcutta," where it was speedily noticed that relief was given by sitting down on the floor. From these statements, it is clear that it is better to have a fire in the fire-place in a close room in winter, than to have no fire; and for two philosophical reasons—the fire rarifies the carbonic acid gas, and compels it to seek the ceiling; besides, it creates a draft up the chimney, thus causing cold air to come in more copiously through the crevices of the room; the inevitable effect of which is, a more copious supply of fresh air, and a more rapid change of air.

Another incidental benefit from having a fire in the fire-place of a close room in winter is, that less bed-clothing is needed; hence, the body is less smothered and sweltered; less oppressed by its own emanations, which are necessarily kept in more or less immediate contact with it, as the bed-clothing is heavier. When it is not convenient to build a fire in the fire-place, a good substitute is had in a large lamp, or jet of burning gas, brought into the fire-place by a flexible tube. These suggestions merit special reflection, as there seems to be a very prevalent opinion that cold air is necessarily pure, and that warm is a synonym of impurity.—*Hall's Journal of Health.*

From Miner's Rural American.

Notice to the Readers of the Rural American.—A Sad Disaster—its Discontinuance, &c.

It becomes my painful duty to announce to my subscribers, that misfortune has come upon me, and the consequence is, that the *Rural American* ceases to exist with this week's issue!

That all persons who are interested in this matter may understand the causes which have led to this great calamity to me, I will give as brief a relation of the facts as I can, and do justice to the subject.

In the fall of 1859, when the John Brown invasion of Virginia took place, I denounced his act severely, and stated, that in my opinion "he ought to be hung." I also commented strongly on Brown's proceedings in Missouri, the running off of slaves, taking horses belonging to their masters, and selling them at auction in Kansas, as he himself admitted. These comments, with other *conservative* sentiments which I then published—and which at *this* time, nine out of ten of the people of the North endorse—greatly offended many of my subscribers, and the result was, that in 1860 I found my paper with a subscription list considerably diminished, and in order to reinstate it, I concluded to make important improvements in it, and to make a vigorous effort to give it an extensive circulation in 1861.

I reasoned in this wise, that as the country was very prosperous up to Nov. last, before which time my arrangements were mostly perfected, and after the political campaign was over, a very favourable opportunity would be before me to place my paper upon a more prosperous basis than it had ever occupied before. In order to effect this object, I was aware that my credit would have to be used to some extent. I needed a new press, my old one being incapable of doing good work, and was, moreover, too slow. Having procured every thing essential to carrying out my plans, I found myself, in December last, more in debt than I had apprehended, yet the very extensive notoriety which I had given to my paper, by advertising, and circulating sample copies, led me to suppose that it was almost morally impossible to fail to receive less than *ten* thousand more subscribers than I had in 1860, while *five* thousand, would, I think, be sufficient to place my paper on a solid foundation. Full 20,000 *sample* copies of the paper were called for by persons who mostly had never before seen it; and notwithstanding the scarcity of money, and the existing "panic," I felt no uneasiness as to the result, till early in January, when the cry came to me from all quarters, that owing to the "hard times," but very few subscribers could be obtained. The first two weeks in January produced only about the same receipts that I used to receive previous to 1860; and in a few days they dwindled down to an alarmingly small sum weekly, and the result is, that I find it *utterly impossible* to proceed, owing to the fact, that I have not received money enough to liquidate my liabilities, and at the same time, publish the paper.

This is a terribly disastrous affair to me, and one that will produce much

astonishment, regret, ill-feeling; and probably, *abuse* of me, on the part of my subscribers; but to save my *life*, I could not avert the disaster in any *possible* shape or manner, as every dollar's worth of property that I possess, would not, at *this time*, sell for enough to carry the paper through the year, if I did not owe a cent.

Probably no one can *fully* understand the case, form this explanation; but I will say, that the receipts, thus far, have been expended in paying up matured obligations, and the current expenses of the business, which are very heavy, and I now find my receipts so greatly diminished, that a continuance of the paper, in any shape, is *utterly hopeless*. Nor was I without hope of a better state of things taking place up to the very day that this paper went to press.

In this catastrophe, I lose the accumulated savings of a life of over thirty years of the most unremitted toil! Yes, reader, *all* is lost, and nothing will, according to present appearances, be saved from the wreck! It is a case for your pity—not for your *curses*, which latter, I well know, will be bestowed upon me by unfeeling subscribers.

To cap the climax of my misfortune, a disease, which has been fastening its subtle coils around me for ten years, now threatens to deny me the ability to earn a living in any manner, and what is to become of me and my family hereafter God only knows.

It is torturing to the sensibilities of my mind, to make such a development; but *truth* demands it, that my subscribers may know my real condition, and inability to pay them their dues. I am too far advanced in years, and unmanned by disease, ever to recover from the calamity, and my career, as a publisher, is now ended. I have striven hard to sustain my paper, but the "times" have been too crushing, and I am compelled to yield.

To my club agents and all friends, who have done their best to aid the circulation of the "*Rural*," allow me to say, that my heart is pierced with the deepest anguish, that I should be the means of bringing upon them the contumely, and hard thoughts of those whom they have persuaded to subscribe for it. It is crushing to my spirit, and will sting me till the grave shall cover me from the face of man, while I have done all, as I verily believe, for the best, and with reasonable prospects, as I supposed, of success.

It may be considered unmanly in me to thus enter into the details of my business, feelings, position and future prospects, but so great a calamity, and especially one so soon after commencing a new year, requires a more than ordinary exposition; and when I look back and reflect on the nine years of very hard mental labor that I have endured in Clinton, in order to save a small pittance against the day of age and infirmity, and now find all swept away, health gone, and poverty my future inheritance, my breast is filled with the deepest anguish, and I feel, at times, that life is almost insupportable.

All my readers, I think, will admit that the *Rural American* is deserving of a better fate. Owing to illness, I have been unable to give it much attention

during the last few numbers, but my son, with some help, I think, has shown quite good judgement in his selections, and has got up a very fair paper.

In conclusion, allow me to say, that at present I see no possible way of refunding dues even to subsribers in this immediate vicinity, as all that I possess must go to satisfy my more heavy creditors, as the case now appears; but should I ever have it in my power to repay them, they may rest assured that I shall do it.

I am thus particular, so that I may not, in my illness and broken spirit, be harrassed with importunities, enquiries, and demands that will be *utterly out of my power to attend to.* I, therefore, here give notice that all letters that shall remain *unanswered*, may be considered in this way, that *it is out of my power* to comply with requests made, or that my answers would *not benefit them.* I am not only too ill to sit down and answer a dozen or two letters a day, but what is to become of me and my family, must be the first object to which I can now give my attention.

To show the effects of the "hard times" more clearly, I will say, that in all probability, if this paper could be continued, I should have no more subscribers than I had in 1860, although about $500 were spent in Nov. and Dec. in advertising, postage, showbills, specimens, &c., in order to give it a wide notoriety; and, as already stated, full 20,000 sample copies were distributed all over the country. I now print but about the same number of copies that I did last fall, and with the greatly increased expenses of the enlarged paper, under any circumstances it would be a loosing business with simply my old number of subscribers. A paper of this size and character can be afforded at *one dollar* a year in clubs, with a circulation of moderate extent, but not on the support that it is now receiving.

I have done all that lay in my power to ensure success, and believed that I should succeed; but the fates are against me, and I must yield. God knows that my *intentions*, designs, anticipations,—all have been right. Errors I may have committed, but they were all of judgment, with a veil covering the future, through which my vision could not penetrate. I have done no act, entered into no contract that now embarrasses me, which at the time effected, I did not fully believe was for the best, although *now*, when my receipts are cut off by the money pressure of the country, I see my mistakes. My case is a hard one,—yes, terribly severe, because the savings of a life are lost, and with them health also. Let the judgment of the public be tempered by charity, because if all the facts pertaining to my business were fully understood, no man could in reason condemn me.

With this truthful exposition of my affairs, I bid my subscribers farewell.

T. B. Miner.

Clinton, Feb. 23, 1861.

P. S.—Exchanges will please discontinue.

☞ No blame should be attached to any traveling agent of this paper, who, of course, could not be expected to know what could happen to the prosperity of it.

Bone Manure.

Bone manure is universally considered one of the very best kinds that can be applied to the land, whether for corn, grass, or root crops, and its extensive and increasing use is a proof of the estimation in which it is held. Not only are the bones of those animals slaughtered in this country employed as manure, but nearly 80,000 tons per annum are imported from foreign countries, chiefly for the same purpose, and yet the supply is by no means equal to the demand. Had not the importation of guano commenced about the year 1840, it is probable that bones would have risen to £10 or £12 per ton.

"That bones must be beneficial as manure," says Mr. Nesbit, in his pamphlet on Agricultural Chemistry, "will appear from a very simple consideration. Animals are fed upon vegetables, and the whole of their bodily structure grows out of the food, or is eliminated and formed from it. If the food did not contain phosphate of lime, the bony structure of the body could not be built up. If the soil in which vegetables grow did not contain phosphate of lime, the seeds of vegetables could not be matured. Supposing the arable land of this country to have been robbed for a thousand years of phosphate of lime, and never to have received any back again; assuming this ingredient to have been continually exported in the shape of milk, cheese, sheep and oxen, it is clear that unless the land had an unlimited amount of phosphate, which we know is not the case, there must have been a proportionate diminution in the quantity of such materials. Hence it is that when certain substances which have been taken out for a long period have been again suddenly applied, land worth hardly 5s. per acre has sprung up to the value of 15s., and there has been an enormous increase of crops."

One of the most valuable qualities of bones is the slowness with which they decompose, and the length of time during which they continue to give out the phosphates. It is found upon analysis that one pound of bones contain as much phosphoric acid as 28 pounds of wheat or 250 pounds of potatoes. Now, a crop of wheat of four quarters per acre, and reckoning it at 60 pounds per bushel, weighs, in round numbers, 2,000 pounds, which contains only as much phosphate as is found in 71 pounds of bones. It is clear, therefore, that if the bones are put on at the rate of 3½ cwt. per acre, supposing them to decompose rapidly and give out the phosphates in proportion, a large proportion would be wasted. But this is not the case, as the following circumstances prove. A gentleman, who occupied a large farm in Norfolk, finding, towards the close of his wheat-sowing, that he was likely to have a considerable quantity of bone-dust left, if he continued distributing it at the ordinary rate, directed his foreman to increase the quantity. On going to the field the following day he found the man had *doubled* the allowance, and that instead of having any to spare, he would not, at that rate, have enough to finish manuring the remaining seeding land. He therefore told him to go back to the usual quantity of about 4 cwt. per acre, at which rate the field was finished. The crop of wheat proved a very heavy one, as well

as the succeeding crop of turnips, on that part of the land which was doubly dosed with bone dust. Now mark what follows. *Eleven years after*, the farmer, on riding with a friend over his land, came to this field, which was again, for the third time after the above occurrence, under wheat. On entering it, he requested his friend, if he should, in riding down the furrow, find any difference in the growth of the wheat, to point it out. After riding a few yards into the wheat he suddenly stopped. "What in all the world have you been after here?" he exclaimed. "This wheat is six inches higher, and as stout again as the rest; how came this to pass?" The farmer then explained to him the occurrence we have related, and which proves not only the value of bones as a manure for a single crop, but that by the deliberate manner in which they give out the phosphates in decomposition, they possess a more permanent value than any other kind of manure.

But bones are not only valuable on account of the phosphoric acid they contain; they also contain nitrogen in the proportion, according to some chemists, of six, and of others, of four per cent. As the bones decompose, this becomes ammonia, the value of which in manure is now well understood by almost all agriculturalists. The conversion of bones into superphosphate of lime by the addition of sulphuric acid, by precipitating the decomposition, probably alters the conditions, by causing the immediate distribution of the phosphoric acid in the sod; and thence it requires a less quantity to be applied to the land to produce a crop.

The Americans have adopted a new method of dissolving bones, which may probably be employed to advantage in this country, as the bones will not require to be ground. A ley is made with lime, in the proportion of one bushel of lime to sixty gallons of water. To 200 pounds of bones put 60 gallons of ley, and boil them for a few hours until the bones are dissolved, when they may be reduced to a dry powder, and applied in the same way as guano, or any other artificial manure. This mode of application has been found to produce very satisfactory results. The lime used was made of oyster-shells, as the best for the purpose. "It has been repeatedly demonstrated," says an American writer, "that one bushel of dissolved bones, *for immediate effect*, is equal to five times as much ground bones; in other words, that one pound of *nascent*, or soluble phosphate of lime, is worth more than five pounds of *normal*, or natural phosphate of lime, or bone earth."

This economic application of bones is becoming more and more common, being cheaper, and involving less labour, and the result is quite as certain and as good. The only difficulty in the purchase of bones, in whatever form, is that of getting them genuine, on account of the adulteration with *scutch*, or the refuse of the tanpits, oyster-shells, and other cheap ingredients, the proportion of which in bones is regulated, with some dealers, by the price paid per ton. We have known as much as fifty per cent. of scutch mixed with bones, as agreed on between the merchant and his customer, a country bone-crusher.—*Lon. Far. Mag.*

For the Southern Planter.

The Concord Grape.

This grape is becoming more popular as it becomes more known. It is a seedling of the Isabella, and originated in Concord, Mass., some ten years ago. It is a very thrifty grower, like the Isabella, but yields more profusely and regularly than the parent vine, while it ripens from ten days to two weeks earlier than that variety.

The color of the fruit is black—berries considerable larger than the Isabella—flavor delicious, and the grapes ripen much more evenly on the bunches than that variety.

The Concord is much more hardy than the Isabella, Delaware, Diana, Rebecca, &c., and requires no winter protection South of the State of New York. In that, and all other States of the same climate, it is better to lay down the vines in the fall, and cover them slightly with earth, rather than to run any risks of the severe cold weather. Indeed, it is now recommended by our best grape growers, to lay down all varieties, and cover in the fall, whether hardy or not, on account of the better condition of the vines in the spring. There appears to be less drain of sap from the roots, when vines are thus protected, and the consequence is, that the buds break more freely and evenly, and the crop of fruit is larger, and better secured from all contingencies pertaining to the power of vines to yield fruit.

I am of the opinion that grape-vines should be thus protected, even in the "Old Dominion"—not that the frosts of winter would injure the hardy varieties, but that the crop of fruit would be enough more to pay the expense, which is not a half a cent a vine in vineyards.

By the way, can some friend of the vine inform me, what the prospects would be, in Virginia, or Maryland, to plant a vineyard of Concord grape-vines, of ten, fifteen, twenty, or more acres, for wine-making, or for selling the fruit in the New York, or other markets? I presume that I could supply 20,000 vines next fall for such a purpose, and I would be willing to enter into an arrangement with any gentleman to supply the vines, that might be mutually advantageous.

The fruit of the Concord vines is worth in the New York market, at wholesale, 10 cents per pound. An acre will produce from 10,000 to 12,000 pounds when in full bearing. As a wine grape, it excels all other kinds. I have averaged a barrel of wine from only *six bushels* of grapes! The Concord contains more alcohol than any other grape known, even 25 per cent. more than any European variety.

This grape has, as yet, no disease—perfectly free from rot, mildew, and all defections that blight the hopes of the Ohio grape growers. And it greatly improves in the latitude of Maryland and Virginia—not only in quantity of fruit, but also in flavor. Moreover, it flourishes in a *poor soil;* and there are but few fields in Virginia, where this grape would not grow luxuriantly, with seasons of the usual rains.

I am growing the Delaware and other popular varieties, but the Concord, as a *vineyard* grape, is superior to them all. The Delaware requires quite too much *nursing*, and it grows entirely too slow. It makes no difference what dealers in that variety may say in regard to this fruit, it is an undeniable *fact*, that the Delaware is a slow grower, and a "shy" bearer, until it has attained considerable age.

T. B. MINER.

Clinton, Oneida Co., N. Y.

For the Southern Planter.

Hungarian Grass.

During the last few years much has been written and published in regard to Hungarian grass. It has been claimed that it is an old variety of *millet* under a new name—that it is not profitable to grow, &c.

I have grown this grass and fed it to stock—am now feeding no other kind of hay. It has been grown extensively in central New York, and it now bears a good reputation—one that is not a *humbug*.

It requires about a half a bushel of seed to the acre. That quantity is what I have sown; but at the West some farmers sow only ten or twelve quarts to the acre. It should be sown as soon as the weather becomes settled down to a summer heat, perhaps, in Virginia, early in May, while here, we wait till the first of June, and sometimes later. If sown earlier, the weeds and wild grasses are apt to get the start of it, and injure its growth.

It produces, generally, in moderately good soil, from three to four tons of hay to the acre, and from twenty to thirty bushels of seed, worth as much to feed to any kind of stock, as so many bushels of oats.

When the grass is left, in order to ripen the seed, it is not destroyed for feeding to stock. Indeed, I do not think it is injured at all. It is a little more colored—a yellowish hue, but horses and cattle eat it with great avidity.

When the seed is not desired to be threshed out, the grass is cut about a week earlier, and the hay thus made is of a very nutritious character, and horses fed on it, should have but little grain of any kind. Some complaints have been made, that this hay injured horses; but the cause has been traced to feeding too much grain in connection with it. The seed of this hay contain a great deal of oil; and, therefore, horses may be injured by over-feeding on it and grain at the same time.

The Hungarian grass, or millet, is an annual plant, requiring to be sowed every season. On poor lands, I presume that it will produce a poor crop, like all other vegetation. On rich soils, the crops will be heavy and luxuriant.

Some of my farmer neighbors have thought that this grass impoverished their soil more than ordinary crops; and I am not sure that they are incorrect in that opinion. I sowed a field to this grass in 1859, which was planted to corn last year, and the crop was very small, owing to the grass crop having, apparently, drawn the most of the fertility from the soil. I have not, however, seen or

heard of any bad effects of this grass crop on soils in other places, and I am inclined to believe, that it is no more injurious to soils than oats or corn.

The present price of Hungarian grass seed, in Chicago, is about one dollar per bushel, and ought to be sold in the South at $1 50 to $2 00 per bushel.

I think that Virginia farmers, who have but little good grass land, would do well to sow a few acres of Hungarian, as an experiment.

T. B. MINER.

Clinton, Oneida Co., N. Y.

From the Farmer and Gardener.

Mast as Food for Swine.

MR. EDITOR: Last Fall we had in this section of country a very abundant crop of acorns and chestnuts. In a thirty acre lot, on my farm, the ground was literally covered with them, particularly of the former. My hogs were turned into the enclosure about the first of October, and improved rapidly for a short time. I observed, however, after some weeks, that they began to lose their plump appearance, and that several of them had a wheezing cough, and difficulty of breathing. A few of them became quite sick; and a fine sow, near the time of farrowing, cast her litter. A neighbor, whose hogs were enclosed like my own, said that his appeared "like a set of drunkards just emerging from a spree."

I hear the same complaints from all around me; and the general opinion amongst them is, that the animals suffer from the shells of the mast lodging in the stomach, where they remain undigested, and produce irritation and inflammation of that organ. I think this opinion is in some degree well-founded, for I notice the shells in the excrement, apparently unaffected by the powerful gastric action to which they have been subjected. The difficulty of breathing, I suppose, can be accounted for by presuming that small portions of the shells may have lodged in the pharynx. But how are we to account for the *narcosis*, which was palpable and unmistakeable? Some sorts of acorns, especially those of the red oak, (*Quercus rubra*,) of the black oak, (*Q. nigra, vel tinctoria*,) and others, contain considerable quantities of Prussic as well as Tannic acids; but hogs will not eat these as long as the others are abundant. It is true, those of the white oak (*Q. alba*,) contain more or less of these acids, (the Tannic predominating,) but I think the quantity too inconsiderable to produce the results which I have witnessed. If the effects which we observe now are attributable to them, why did they not have the same effect on our hogs before? Only a few years ago, our porkers were occasionally fattened upon the acorns alone. Can anybody explain?

It may become an interesting subject of inquiry whether the fruits of our forest trees, like those we cultivate for the sake of their edible pulp, are deteriorating. Does anybody know?

There was a tradition amongst the Greeks, that the oak was the first created

tree; and it is known that the fruit of them constituted, at one period of time, an important portion of their food. Virgil tells us to

> ———"Thrash the woods,
> For mast of oak, your father's homely food.

And Ovid corroborates their use,

> "Content with food which nature freely bred,
> On wildings and on strawberries they fed.
> Cornels and bramble berries gave the rest,
> And fallen *acorns* furnished out a feast."

Those familiar with our early struggles for independence of the mother country, will remember how the Continental soldiery ate them for lack of more sumptuous viands. But Turner, who was probably the earliest English writer who wrote upon the subject, does not appear to have had a very favorable opinion of them as human food; for, he says, in the quaint language of that day, "Oke, whose fruit we call *acorn*, or *eykorn*, (that is the corn or fruit of an eyke,) are hard of digestion, and nourish very much, but they make raw humores, wherefore we forbid the use of them for meates." Yet the early Britons certainly ate them. The Druidical priests taught them, that everything that was produced upon the oak, even to the parasitical mistletoe, was of heavenly origin; a superstition which was common also among the Persians. They are, to this day, the food of the lower orders of Spaniards; but then it must be remembered, that the acorns of Spain are much more nutritious and sweet, than those of England or the United States.

Acorns are said to have been the primitive food of mankind. We have no means of knowing whether they have undergone an unfavorable change in the land first peopled by the human race. That human tastes *do* undergo very great changes admits hardly of a doubt. At any rate, modern epicures would not, I fancy, esteem the acorn much of a feast.

Thomas Tusser, and old English agricultural writer, who had a sort of innate proclivity for versification, said many truths in his "Boke," "*A Hundreth Good Points of Husbandrie*," published in 1557. Speaking of acorns, he says:

> "Some left among bushes shall pleasure thy swine,
> For fear of mischief, keep *acorns* from kine."

They are injurious to all ruminating animals, particularly to sheep. Whether it is owing to the Tannic and Prussic acids that they contain, or whether it is because ruminants cannot belch them up to undergo a second mastication, remains to be decided. Their effects upon cows are a drying up of the milk, constipation, wasting of flesh, and general debility.

But, friend Spangler, when I commenced, I only intended to speak of them in reference to their misjudged value as food for swine, and to solicit from your numerous able correspondents such information as will be useful for farmers generally. A few words more and I shall conclude for the present.

After putting up my hogs, they fattened very slowly. Indeed with all the careful and liberal feeding that I gave them, I did not succeed in making them anything near as fat as I wished them to be. An old and experienced hog-dealer, to whom I spoke upon the subject, told me that I would find it impossible to fatten them thoroughly. He further stated, that he could always tell when a lot of hogs had eaten largely of acorns. They never endured traveling without becoming lean, and they could not be made fat for the same season. What is the reason?

F. J. Cope.

Hemphill, Feb. 5, 1861.

For the Southern Planter.

Roup in Chickens.

Messrs. Editors.—I have seen several inquiries in agricultural papers of late, from persons who are anxious to learn some cure for chicken distemper or roup. And as I have found out a remedy, after trying every thing I thought would do any good, I send it to you to publish, that all may know it and profit by it.

I have been raising from several varieties of English game for many years, and never until 1859 knew what the roup among chickens was. I purchased several varieties during 1859–60, in Pennsylvania, and when I got them home I found they had a disease that effected them in three different ways. Sore throat one; another, one or both eyes would be diseased, and the third, the head-comb, &c., generally would have ulcers. I tried caustic washes and various other things, and after great care and labour I cured the most of them. At this time my other fowls had taken the distemper, and as I thought of the many things used, not one could I rely upon as a certain cure, and my patience nearly worn out, I concluded to try, as an experiment, some Cod Liver Oil, and picked out a chicken that had his throat and mouth nearly one solid ulcer. To this chicken I gave a teaspoonful of the oil morning and night, and rubbed his head well with the same. For three days I kept up this practice, and at that time I found out the oil purged too much, so I lessened the dose and gave half a teaspoonful night and morning, and continued to rub the head and throat well with the oil; and to my surprise and gratification the chicken got well. I then tried it on several, and cured all. And now, with one year's experience, I can say that every chicken, if taken before the disease runs too long, can be cured. Now this is a simple remedy, and I know it to be a certain cure.

It may be asked if I have not lost some fowls since I found out this remedy. I will say yes, and it was because the disease was too far advanced and the chicken too weak.

Yours, respectfully,

Caroline.

Biscuit.—Two quarts of flour, one tablespoonful lard, one teaspoonful soda, half teaspoonful salt; mix with cold water, and beat well.

From the Farmer and Gardener.

How we Waste Manures.

The collection, management and application of manures, is perhaps, the most important branch of farm practice. And what is equally true, it is one which is in greater need of improvement, than almost any other. For a number of years past, agricultural chemisty has explained the proper method of managing manures, but thus far, its teachings have had but a partial effect. The fact is, if there were no other cause for the deterioration of our soils, and consequent annual diminution of our crops, the waste of manures would sufficiently account for it. No one at all, familiar with the subject, will, we presume, pretend to dispute the assertion that in this direction at least, we are more wasteful than any other nation in the world. Were the same unthriftiness practised by the Chinese, with their dense population, or even by the German States of Europe, the result would be actual starvation, if as at present the people were dependant upon the products of their own soil for support. It is almost impossible for an American farmer, who has not had the opportunities for personal observation, to form anything like a correct idea of the jealous care with which the smallest particle or shred of every manurial substance is collected and husbanded by European nations generally. It is asserted on good authority, that at least one-third of the nutritious value of food used by the people of the United States, is lost either in its preparation, or, by actual waste; and it may be as safely asserted that fully one-third, (we were about to say one-half,) of our available fertilizing material is also wasted and lost. Unlike as this may at first glance appear, we have abundant evidence to sustain it, and did space permit, it would not be a difficult matter to satisfy every reader, that we annually waste nearly as much manure as we use. Our limits will only permit a brief reference to one or two of the principal sources of waste.

First, we have the *drainage of our cities and towns.* This is composed mainly of the rich dirt from the streets, the wash-waters from the kitchens, the refuse of manufactories, the cleaning of water-closets, together with a variety of other substances, rich in manurial ingredients.

The following statistical fact in relation to the sewerage of London, will convey a better idea of the immense waste of valuable fertilizing material, than anything we could say upon the subject.

"By carefully conducted experiments, and very accurate guagings, it has been found that the chief London sewers convey daily to the river Thames, about 115,000 tons of mixed drainage, consisting, on an average computation of one part solid and 25 parts absolutely fluid matters; but if we allow one part in 30 of this immense mass, to be composed of solid substances, then we have the large quantity of more than 3,800 tons of solid manure, daily poured into the river from the city of London alone. Allowing twenty tons of this manure as a dressing to the acre, the annual waste equal to the full fertilization of 50,000 *acres* of the poorest land. This, with a fair average yield, would maintain at

least 150,000 persons. And this enormous waste flows from one city only, and refers only to the solid matter. The fluid portion is also rich in fertilizing matter, salts, &c., combined with the water."

Now the same estimates may be made with reference to all our American cities and towns, with this difference in favour of our superior prodigality, that our people being better fed than the majority of the people of London, or of England generally, and permitting more of our food to go to waste, either before or after preparation for the table, our sewerage is consequently richer in fertilizing ingredients, and the waste of course greater.

Is it not a striking comment upon our farming economy, that while we are sending our ships to the remotest parts of the world for guano, with which to maintain the fertility of our soils, we are permitting millions upon millions of dollars' worth of equally valuable material to flow past our very doors, and pour itself into the sea? Nay, we do more, we puzzle our brains to devise the most effectual method of getting rid of it, with the least possible expense and trouble. The Agricultural Chemists and Engineers of London, have given the subject their attention, and a movement is now on foot to arrest the further progress of this enormous and heedless waste of manure, so far as that great city is concerned.

A celebrated English writer, in answering to the inquiry, *What is sewerage?* says, "In it the chemist recognizes rounds of beef and basins of turtle, cargoes of sugar, coffee and port wine, millions of four pound loaves, and thousands of tons of cheese and butter. Therein are not only all the alimentary productions of our own country, but also our enormous alimentary imports, altered in form it is true, but scarcely altered in utility or value. It is truly a well known, but unworked, mine of gold, equal in value to one-half the interest of our national debt. We might call it a stream of liquid guano. It exists in a form of peculiar availability and almost self-portability; its fertilizing powers are enormous. We may estimate its value by the sums expended to compensate for its loss. We pay for our guano, two million of dollars annually. For unprofitable oil cake and corn to feed our manure-making animals, many millions, and vast sums are annually abstracted from the agricultural pocket for phosphates and other artificial manures."

It is not for us to point out in what manner this unpardonable extravagance is to be checked. "Necessity is said to be the mother of invention," and when we have exhausted all our other manurial resources, then, perhaps, some plan will be devised for bringing into profitable use this immensely valuable material.

But let us turn our attention nearer home for a few moments, and see whether we are as economical of the manures of the farm as we should be. It is to be feared that a strict investigation in this direction would develop little, if any, less prodigality than in the sewerage of our cities and towns.

We have already adverted to the unceasing attention given by the Chinese

to the collection and careful preservation of every substance however trifling, which will in any degree serve to enrich the soil and increase their crops. We might profitably imitate the example of "John Chinaman" in this particular, for certainly, no department of farm practice has been as grossly neglected. Many of our farmers absolutely waste as much manure as they apply beneficially, or, in other words, permit one-half of it to go to loss through downright neglect or misapplication.

This neglect is shown in a variety of ways. We see it in the location and construction of our barn-yards. Were it a special object with the farmer to expose his manure heap to the fullest action of the sun, wind, and rain, and to afford the most complete outlets for all the liquids, he could not accomplish it more effectually than by following the plans of tens of thousands of farmers, in our own and adjoining States. The barn-yards, as a general thing, slope from the barn or stables, and as a consequence the liquid manure soon accumulates at the lowest point. The first rain causes it to overflow the trifling barrier sometimes raised to prevent its escape, and away it goes to the nearest rivulet, to the horse-pond, or in the public highway, to be lost to its owner forever. Few who have not studied this subject, are aware of the immense quantity of fertilizing material, that accompanies the little black stream that oozes so quietly and steadily from the majority of our barn-yards. If such careless farmers were to behold gold dollars rolling from their pockets as rapidly as gold dollars worth of liquid manure flows from their manure-heaps, what immense activity would immediately be manifested, and how energetically would they go to work to stop the drain. Its apparent insignificance is the reason why it is permitted, for if farmers understood as they undoubtedly should, the actual dollar and cent value of the material they are thus permitting to escape them, this, another one of the every day errors of farming, would be speedily corrected.

The fact is, true economy points to a complete reformation in the management of our manures, and more particularly the manures of the farm-yard. How many farmers are there who give a single thought to the importance of protecting their manure heaps from the injurious effects of exposure to the sun, wind, and rain. True economy points to the covered barn-yard; to the properly prepared manure pit; to the indispensable tank for the surplus liquid manure; to the protection of the manure-heap from the deluges of rain-water, which are poured upon it from unspouted barn-roofs, and other buildings, every time a rain falls. Agricultural chemisty has conclusively demonstrated the absolute necessity that exists for attention to these points, if the farmer desires to save from total loss, a very large proportion of his manure. It teaches him that a loss of manure, is equivalent to a diminution of his farm products. If permitted to continue, it can result only in either gradually impoverishing the farm itself, or what is equally unfortunate, the pockets of the farmer himself.

It should be a cardinal principle with every farmer, to allow no portion of fertilizing material, however minute, to go to waste. The scrapings of the road-

side, old shoes, woollen rags, hair, bones, the wash-water of the kitchen, soap-suds, the contents of the water-closets, unripe weeds, in fact, a thousand little matters which are not only permitted to go to waste, but are in many cases regarded as nuisances, and the disposition of which is often times a source of annoyance and inconvenience to the farmer, all possess a high manurial value, and one of the most common of our every day farming errors, is to permit them to be lost, instead of adding them to the compost or manure heap. If neglect to preserve and apply these valuable materials is the result of indifference, it properly belongs to the class of every day errors. If, on the other hand, it proceeds from ignorance of their value, the sooner this want of information is supplied by the teachings of Agricultural Chemistry, the better it will be for the interests of the country at large.

Horticulture in California.

We have received the report of the third annual fair of the California Horticultural Society, held at San Francisco in September last. It gives a lively idea of the horticultural resources of our great western state. At this exhibition of the products of California were seen the lemon, the orange, the fig and the pomegranate, with the luscious peach, the more hardy pear and apple, and flowers of rare hue and fragrance.

Among the vegetable monstrosities was a huge red beet, weighing one hundred and fifteen pounds. When it weighed forty-two pounds it was exhibited and then again stuck into the ground to produce seed, and in twelve months it gained 175 per cent in weight. If the owner should pursue the same policy for several years more, and it should grow in the same proportion, it would weigh 315 pounds in September, 1860, 855, in 1861, 2,300, in 1862, and so on. It is now about four feet long and nearly a foot through.

One grape-grower sent from San Jose no less than 80 varieties of grapes. The president of the Society exhibited 57 varieties pears, 40 of apples, 16 of peaches, 10 of plums, and four of nectarines. Of flowers several gentlemen contributed each collections of cut roses, embracing some one hundred varieties. A gardener sent a cabbage three feet seven and a half inches in circumference.

There were also exhibited several specimens of the Chinese tea plant; they were a part of a lot of twenty-four which were brought last summer from Canton, in their native earth. The transplanting proeess retarded their growth, but they thrive successfully in their California home, leaving no reason for doubt as to the suitability of the climate for tea culture.—*Post.*

LEMON CUSTARD.—Three lemons grated, one pound sugar, eight eggs, a piece of butter size of a walnut. Beat the yolks, sugar, lemons and butter together, the whites to a froth, which are not to be added until ready for the oven. Bake on pie-crusts.

Editor's Department.

Green Crops for Cattle Food.

We would earnestly advise all of our farmers to devote a few acres to the purpose of raising green crops, to feed away to horses, cows, and other farm stock, during the summer.

If they will pursue this plan, they can lay by a much larger supply of hay for use next winter, and by preparing for a large stock of cattle to be fed during winter, they may have for them, when that time arrives, the most ample abundance of food—the cattle can be wintered at a very inconsiderable expense, and a large stock of the most valuable kind of manure be on hand in time for the next corn crop. This system has proved profitable wherever it has been adopted, and we are sorry to say, has very few followers in this country. Some farmers, who practice it regularly every year, have made fortunes in agricultural pursuits, and are proofs that farming, when well managed, "will pay."

Corn, when sowed broadcast, at the rate of *three bushels to the acre,* will furnish an almost incredible amount of provender for stock. Milch cows can be brought up to their maximum yield of milk, by its use as food: nor is it at all objectionable as provender for horses. It is necessary to give animals a plenty of salt, air-slacked lime, and ashes, while they are fed principally upon it, since the amount of sap contained in it is so great, that fermentation in the stomach, at any time when that organ may be even slightly disordered, will be sure to produce colic, or scours.

Sow three bushels of corn upon one acre of good land, and harrow it in. If the land is not already sufficiently rich, apply one hundred pounds of guano, mixed with two bushels of plaster, to it.

Chinese sugar cane should form part of this "Truck Patch," since it is an article of excellent food for stock of all kinds, and generally yields a luxuriant crop. So many experiments have been tried with it, that its excellence is fully established, and nobody has a right to call it a "humbug" any longer. The same precautions are necessary to guard against colic and indigestion among the animals fed on it, as we mentioned with regard to green corn.

Hungarian grass, and *millet,* are very highly spoken of by many persons who have tried them. We have raised one small lot of the former, and were highly pleased with it as hay. Cattle are very fond of it, and on rich ground, more than one cutting may be had. When it is allowed to ripen, we think the seed should be threshed out before its used as hay, since they are very hard, and so rich in oleaginous matter, that we think there is some danger of *over-feeding*

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THE SOUTHERN PLANTER

Is published monthly, in sixty-four octavo pages, upon the following TERMS:

TWO DOLLARS AND FIFTY CENTS per annum, unless paid in ADVANCE.

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