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FRANK: G. RUFFIN, EDITOR.

THE SOUTHERN PLANTER.

DEVOTED TO

AGRICULTURE, HORTICULTURE,

AND THE

HOUSEHOLD ARTS.

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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.*

FRANK. G. RUFFIN, Editor. F. G. RUFFIN & N. AUGUST, Prop'rs.

Vol. XVII. RICHMOND, VA., MAY, 1857. No. 5.

For the Southern Planter.

Superphosphate of Lime.

Mr. Editor:—The fact that so many establishments for the manufacture of *superphosphate of lime*, are springing up in and around nearly all of our large cities, Richmond included, indicates very clearly that there must be a very considerable and rapidly increasing demand for this manure—a demand which, there is reason to believe, has not arisen solely on account of the intrinsic merits of the article, but from the high price of guano, the extraordinary virtues ascribed to superphosphates by manufacturers and manure venders, and several other causes. It may not be out of place, therefore, to call the attention of farmers to the composition and properties of bones and superphosphate of lime, explain the differences between them, to show how the superphosphate ought to be prepared to ensure its good quality, what farmers have a right to expect in the purchase of it, &c., and, what is of more practical importance to them, to show that there is no manure of more uncertain composition, and no other which falls so far short of what it professes to be, as this does in nine cases out of ten. I have given the subject very considerable attention, and propose in the present paper, to discuss it so far as it is a *chemical* question. I have nothing to say, however, in relation to the value of superphosphate of lime, for this or that particular crop, or how it ought to rank as a fertilizer; but leave these questions to be answered by the farmer after he has had time and opportunities for thoroughly testing its value.

The bones of animals are composed of moisture, animal matter, phosphate and carbonate of lime, and very small quantities of chlorides and sulphates. The bones of different animals differ somewhat in the proportion of the various ingredients, and no analysis could be given which would apply to all cases; the following, however, will pretty fairly represent their composition:

Water and animal matter,	48
Phosphate of lime with a little magnesia,	46
Carbonate of lime,	4
Chlorides and sulphates,	2
	100

Their value as manure depends mainly upon the phosphate of lime, and the amonia which results from the decomposition

of the animal matter. When whole bones are applied as manure, they undergo decomposition in the soil so slowly, that their effect is at first scarcely perceptible; and it is only after years of exposure, that the full benefits resulting from their application are experienced. By breaking the bones into small pieces, and thus exposing a larger surface, something is gained; and a still greater gain is effected by using the bones in a fine state of division, as in bone dust. But even here the benefit is not so immediate, or, at first, so marked, as we are led to expect, from a knowledge of their composition. This arises from the extreme insolubility of the phosphate of lime contained in the bones; the same remark is applicable to the mineral phosphate of lime, to bone ash, and the bone black of the sugar-refiners. It matters not how finely they may be divided mechanically, pure water has no effect upon them; and the weaker acids, such as acetic (vinegar,) and carbonic, have very little. Hence when they are applied to the soil, in which the principal solvent is water very slightly charged with carbonic acid, they may be regarded as almost inert, and yield their phosphates with extreme slowness.

But if bone dust, or either of the other phosphates mentioned above, be subjected to the action of muriatic acid, a complete solution of the whole of the phosphate of lime takes place, and if to this solution we add an alkalie, such as potash or ammonia, until the acid is completely neutralized, the phosphate of lime will again assume the solid form, but in an exceedingly fine state of division; in other words, it becomes *precipitated* phosphate of lime. Chemically this precipitated phosphate is the same as the bone phosphate,—it is composed of lime and phosphoric acid, in the very same proportions that they are found in bones, or in mineral phosphate; but in consequence of its lightness and extreme fineness of division, its properties with respect to solvents are essentially different. The precipitated phosphate is insoluble it is true, but when the water is acidulated with a weak acid, as acetic acid, *it is readily soluble*, and hence when it is applied to the soil, water charged with carbonic acid dissolves more or less of it, and thus it finds its way into the circulation of plants.

The superphosphate of lime is a compound of lime and phosphoric acid which is soluble, and contains more phosphoric acid in proportion to the lime, than is found in the *neutral* or bone phosphate; it may be regarded as a compound of neutral phosphate, with free, or uncombined phosphoric acid, in which the neutral phosphate is soluble, just as it is in muriatic acid. Whenever this compound comes in contact with the various bases, such as lime, potash, etc., which are present in every fertile soil, whether naturally or by the addition of these bases to it, the free phosphoric acid unites with one or more of them, when the neutral phosphate is precipitated, and becomes insoluble phosphate of lime. But as it is in the form of a precipitated phosphate, it is in a condition to be acted upon by the ordinary solvents of the soil. The free acid, by its union with the bases, forms phosphates which are also in a fine state of division: if it meets with lime and magnesia, insoluble salts result,—if with the alkalies, soluble phosphates are found. It is impossible that the superphosphate, unless applied to a sandy waste, should continue for any length of time in the soil as such; neutral phosphates are formed, but these, although for the most part insoluble in water, are readily acted upon by the solvents in the soil, and are consequently immediately available to growing crops. This fact first led Liebig to suggest the use of the superphosphate, and it is upon this, that its superior advantage over bone dust, bone black, and mineral phosphate depends.

The superphosphate of lime is not a natural, but an artificial product; it may be formed from the natural phosphate by the addition of a certain proportion of phosphoric acid, or the subtraction of an equivalent proportion of lime from it. The latter course is the only practicable one. The substance used to separate the lime is sulphuric acid; this being a stronger acid than phosphoric, and having a powerful affinity for lime, it will, when applied to neutral phosphate of lime, take away a part of the lime, forming sulphate of lime, or plaster,—leaving the phosphoric acid in the form of superphosphate of lime.

In preparing this substance, very much depends upon the proportion of sulphuric

acid used; these should be enough to convert *all* of the neutral into superphosphate; less than that would leave a portion of the neutral phosphate unacted upon and more than sufficient for this would only involve the maker in unnecessary expense. It is also important to attend to the state of division of the bone, or other phosphate acted on; some works upon Chemistry applied to agriculture, recommend the use of whole or broken bones, if ground ones cannot be had, and say that by the use of more acid, the bones will soon crumble. This is a mistake; the material should always be in a fine state of division to insure complete reaction between the substances; and even then great care in mixing them is necessary.

Again, it is necessary in the preparation of the manure, to dilute the acid with a certain portion of water; first, to prevent the acid's charing the animal matter; and second, to make the mixture of such a consistence, that the materials may be thoroughly incorporated, so as to insure the most intimate contact between the acid and the phosphate. After the reaction is complete, this water must be gotten rid of by drying the manure in the air, or by artificial heat; or it may be *absorbed* by the addition of some other substance, which substance may give additional value to the manure, or may be worthless.

So variable is the composition of this manure, that no two brands are alike, and very few of them come up to anything like what should be the proper standard of excellence. This results from ignorance and want of skill on the part of some manufacturers; but in very many cases it results from design. The manufacturer deliberately prepares an inferior or adulterated article, knowing that very few persons can detect the fraud for themselves, or will take the trouble to have the manure analyzed before purchasing. Many manufacturers and agents publish analysis of their manures, made by distinguished chemists; but their analysis are not always to be relied on,—not that the chemists are parties to the fraud, but the manufacturer supplies them with one article, and the consumer with another.

Let us now see in what proportions the acid and bone dust should be used, and what would be the composition of a manure so prepared; then we shall be better prepared to decide upon the results of the superphosphates now in the market.

The composition of neutral phosphate of lime is—

Phosphoric acid,	48½
Lime,	51½
	100

That of superphosphate of lime is—

Phosphoric Acid,	71½
Lime,	28½
	100

Now let us suppose that we wish to convert 100 parts of neutral phosphate into superphosphate. In this there are 48½ parts of phosphoric acid; thus:

71½ ; 48½ ; 100 : 68 very nearly. That is, 100 parts of Neutral phosphate, will yield 68 parts of Superphosphate, which will require the removal of 32 parts of lime.

Lime and sulphuric acid will unite with each other in the proportion of 41½ parts of the former to 58½ of the latter; to form plaster, therefore, the thirty two parts of lime which is to be removed from the 100 parts of neutral phosphate, will require 45 parts of absolute sulphuric acid, or 55 parts of the best commercial acid. If now we refer to the original composition of bones, we find that 100 parts of bone dust contain about 46 per cent of neutral phosphate of lime, hence, according to our calculation, this will require for its complete conversion into the superphosphate, about 25½ parts of the last commercial acid. The bones also contain about four per cent of carbonate of lime, which is decomposed with the formation of sulphate of lime the moment the acid and bone dust come in contact with each other; this will consume about 4½ parts of acid. The whole amount of acid, then, necessary to effect the transformation of the neutral phosphate in 100 parts of bone dust into superphosphate, need not exceed 30 per cent of the whole; or say, any amount of bone dust, can, by proper treatment, be converted into superphosphate of lime by the addition of one third of its weight of good sulphuric acid.

The mixture of 100 parts of bone dust, and 30 of sulphuric acid, would, after the

reaction was complete, and the manure had dried as much as it would by exposure to air, give a product having about the following composition in 100 parts—

Moisture,	10
Animal Matter,	2
Sulphate of Lime (Plaster)	39
Superphosphate of Lime,	24

Equal to 35 per cent of bone phosphate.

The animal matter would yield from 1 to 1½ per cent. of ammonia. In this calculation we have supposed the transformation to be complete, and all the phosphate to have become soluble; but in practice this is never the case, as more or less of the bone dust will escape the action of the acid, and therefore remain insoluble.

When this compound is applied to land, and moisture is present, the free phosphoric acid immediately enters into combination with the bones present, forming neutral phosphates which are in an exceedingly fine state of division, and more intimately blended with the soil, than they could be by any other mode of application; while the neutral phosphate which was soluble in consequence of the presence of the free acid, is precipitated in an equally fine state of division, and also intimately mingled with the soil.

If, instead of allowing the manure to dry up, some foreign substance is added to absorb the water, its value is depreciated in proportion to the quantity of foreign matter used, unless the addition consists of some highly concentrated manure, such as Peruvian guano, the sulphate of ammonia, or dried blood. If the substance added contains any bone, such as oxide of iron, lime, or magnesia, the free phosphoric acid unites with them, the phosphates become insoluble, and there is no longer more than a very small per cent., if any, of the superphosphate of lime—*the manure has returned to its original condition.*

From what has been said before in relation to precipitated phosphate of lime, it follows that these phosphates, although insoluble, are far better suited to minister to growing vegetation than the original bone dust, but then the intimate mixture and incorporation of the phosphate with the soil, which results from an application of really soluble phosphate to it, cannot be attained by the use of one which has already been neutralized. But this is not the greatest objection to the use of substances which will neutralize the free acid present; *so long as the practice is countenanced, so long will frauds be almost unlimited.* A farmer purchases what purports to be a true superphosphate of lime, he has it examined by a chemist who tells him that it is *not* superphosphate; that not one particle of it is soluble, or, at most, but a very small per centage; and that all the phosphate there is neutral phosphate. How, I ask, is the farmer to know whether his manure *ever* was soluble, or contains precipitated phosphate, instead of the original bone phosphate, just as it came from the mill, or from the sugar refinery? *If the amount of soluble phosphates is to be no index of the value of the manure, it will be made, (as it sometimes is made,) by deliberately mixing ground plaster with finely ground bones.* The only way to check fraud, and secure a manure that is worthy the name of superphosphate, is for the purchaser to insist upon there being a certain per centage, and that not a small one of soluble phosphate of lime in every particle purchased.

Bone black is prepared in large quantities for the use of the sugar refiners, by heating bones in close vessels so as to exclude the air; after repeated using to clarify the syrup, it loses its properties, and may then be profitably used in the manufacture of superphosphate of lime. In its preparation the animal matter is all decomposed, and in its stead there is left a certain amount of charcoal. When treated with a proper proportion of sulphuric acid, so as to convert all the neutral into superphosphate of lime, it becomes just as valuable as the superphosphate from unburned bones; it is true there is no animal matter to yield ammonia, but the increased per centage of superphosphate more than compensates for this loss, when we compare the money values of ammonia and superphosphate of lime. Refuse bone black has been found to contain from 65 to 75—say 75 per cent. of neutral phosphate of lime, 10 or 12 of carbonate of lime, and about the same proportion of charcoal. 100 parts, therefore, would require about 12 parts of sulphuric acid to decompose the carbonate, and some 38 parts of the same acid to transform the bone into superphosphate of lime; or the bone black would require about one-half its weight of acid.

This would give us a manure yielding 32 per cent. of soluble or superphosphate of lime in 100 parts, equivalent to 46½ per cent. of the neutral phosphate; and as the proportion of sulphuric acid used was larger, it follows that the proportion of plaster would be considerably greater than in other cases. We see, therefore, how valuable refuse bone black is as a source of manure, even when compared with ground bones, and how groundless is the belief, which is quite prevalent, that bone black is greatly inferior to ground bones as a source of superphosphate of lime. By using bone black instead of bones, we shall have some 8 per cent. more soluble phosphate in the 100 parts, equivalent to about 12 per cent. of neutral phosphate, together with a material addition to the amount of plaster, which, as I have said before, is more than sufficient to compensate for the loss of 1½ per cent. of ammonia.

Boiled bones have lost most of their fat and some of their other animal matter, while the proportion of phosphate of lime in them is something greater than in raw bones; in using them, therefore, as a source of superphosphate of lime, a little more acid is necessary than for common bone dust, and the composition of the manure will be somewhat different; there will be a little more soluble phosphate and plaster, and less ammonia.

Bones that have had all their animal matter burned off in the open fire, are sometimes used; they contain some 80 or 90 per cent. of phosphate of lime, and consequently require more acid than is necessary for any other form of bones.

Mineral phosphate of lime, Mexican and Columbian guano, may all be used for the same purpose; the quantity of acid, and in each case, should always be determined by reference to the proportion of neutral phosphate present.

I have before remarked that the complete transformation of the phosphate is not attainable in practice, particularly when the manure is manufactured on a large scale; yet a reasonable approach ought to be made to the numbers given above. In an experiment made in my laboratory, with bones that were not by any means in as fine a state of division as they should be, I prepared a superphosphate in which their was 18 per cent. of soluble phosphate of lime, equivalent to 28 per cent. of neutral phosphates, the entire phosphate present was 35 per cent., so that 7 per cent. of it remained untouched by the sulphuric acid. It also contained the usual amount of animal matter capable of yielding ammonia, and the proportion of plaster due to the quantity of sulphuric acid used. Had I added some foreign substance, the proportion of soluble matter would have been less; suppose, for example, that 25 per cent. of some other substance had been added, then the proportion of soluble phosphates would have been reduced to about 14½ per cent.

Prof. Way, chemist to the Royal Agricultural Society of England, after having examined numerous samples of superphosphate of English manufacture, says, that the farmer has a right to expect from 8 to 11 per cent. of soluble phosphate, and from 1 to 1½ per cent. of ammonia, in every sample purchased. Now, I think this estimate is too low; I think that the farmer has a right to expect some 16 or 18 per cent of soluble phosphate, and from ½ to 1½ per cent. of ammonia in every sample; and if the proportion of soluble phosphate is less than this, then he may fairly expect a proportionate increase in the per centage of ammonia, otherwise he certainly is not getting an equivalent for his money.

To show this, let us take my own sample, in which the proportion of soluble phosphate was not, I am sure, more than ought to be obtained in practice by any one who is at all conversant with his business. This contained 18 per cent. of soluble phosphate; the addition of 25 per cent. of foreign matter would have reduced it to 14½ per cent. If this addition had been Peruvian guano, we should have had an increase of about 4 per cent. in our ammonia, and about 7 per cent. in our neutral phosphate; then the manure would have contained 14½ per cent. soluble phosphate of lime, 14 per cent. insoluble or neutral phosphate, about 5 per cent. ammonia, and the proportion of plaster due to the acid used.

Sulphate of ammonia or dried blood, or a mixture of either of these with guano, would also have been useful additions, because they would have materially increased the per centage of ammonia; but to have added any other substance, such as

bone dust, bone black, wood ashes, etc., would have reduced the proportion of soluble phosphate, without returning an equivalent.

Again, let us take the superphosphate prepared from bone black; I have already shown that the theoretical amount of soluble phosphate in this should be about 32 per cent., equivalent to 46½ per cent. of neutral phosphate. Allowing that there remains 25 per cent. of the neutral phosphate untouched by the acid, the manure ought still to contain some 24 per cent. of soluble phosphate, which would be reduced to 18 per cent. by the addition of 25 per cent. of guano, then the manure would contain about 18 per cent. of soluble phosphate of lime, 16 per cent. neutral phosphate, 4 per cent. ammonia, and a larger proportion of plaster than in the last case.

Superphosphate of lime is sold to farmers at from $40 to $50 per ton of 2,000 lbs., the prices varying with the brands.—Now it can be shown by a very simple calculation, that the materials required for its manufacture, to wit: sulphuric acid, bone dust, bone black, guano, etc., are sold at such prices that the manufacturer would realize a handsome profit from his manure, supposing it to come fully up to the standard of the two samples just referred to.

I repeat, therefore, in view of these facts, that superphosphates which have had no manure containing ammonia mixed with them, and which consequently contain but from 1 to 1½ per cent. of ammonia, should on analysis yield from 16 to 18 per cent. of soluble phosphate, from 8 to 10 per cent. of neutral phosphate of lime, together with a due proportion of plaster, &c.—And that those to which guano or some salt of ammonia has been added, by which a very material increase in the proportion of ammonia has been made, should contain from 12 to 16 per cent. of soluble phosphates, some 15 per cent. of neutral phosphate of lime, together with the plaster due to the sulphuric acid consumed.

Let us now look at the composition of a few of the superphosphates in the market. De Burg's is probably better known, and more extensively used than any other. So many certificates are published in relation to the very great superiority of this manure, and so much is said about subjecting each supply to analysis by well known chemists, etc., that I must confess I commenced this investigation with the settled conviction that De Burg's superphosphate would furnish me with a practical standard of excellence for manures of this class, to which I could refer all others—the sequel will show how far my expectations have been realized.

I have analyzed two samples of De Burg's superphosphate; the analyses were not what chemists term *complete* in all respects, but sufficiently so for all practical purposes. The first one examined had been in my possession for several years; it was made about the time, or soon after, De Burg commenced the manufacture of superphosphate, and had been sent out for distribution among farmers, that they might test its virtues, and was no doubt intended as the *ne plus ultra* of superphosphates.—This sample contained about 5 per cent. of ammonia, 6½ per cent. of soluble or real superphosphate of lime, some 30 per cent. of neutral phosphate of lime, together with about 30 per cent. of plaster, and small quantities of other less valuable constituents. The manure had been prepared from bone black by the action of more or less sulphuric acid, with the after addition of some Peruvian guano, and probably a little sulphate of ammonia. When these results were first obtained, I thought that the manure had been made in good faith, that originally there had been a much larger proportion of soluble phosphate, and that the phosphoric acid had been precipitated by the after use of the guano; I am now satisfied, however, that there never could have been more soluble phosphate than the manure now contains, because I have ascertained that the addition of guano will not precipitate the neutral phosphate of lime.

The second sample I obtained direct from the agent in Baltimore, and may be regarded as a fair average of the manure now offered by Mr. De Burg and his agents to Southern farmers. With the manure the agent sent me an analysis, from which I naturally concluded that it was a very superior article.

This analysis gives us 7 per cent. of ammonia, 41 per cent. of phosphates (without saying, however, how much is soluble phosphate,) etc., and says there are 37 parts soluble in cold water, from which one would naturally infer that there must be a very considerable proportion of soluble

phosphates present, as the manure is prepared for the express purpose of rendering the phosphates soluble. Instead of that, however, I found something less than two per cent. of soluble or superphosphate of lime. Whilst filtering the aqueous solution the finer particles naturally ran into the filter first, leaving the coarser ones still in the vessel in which the solution had been made; something peculiar in this residue attracted my attention, and after washing and drying it, I, instead of analyzing it, inspected it carefully with the aid of a powerful eyeglass. I found quite a number of small transparent crystalline plates, which looked very much like the mineral *selenite*, or crystalined sulphate of lime, (plaster) together with a great number of white grains, which were evidently not particles of bone dust. By the aid of my glass and a pair of forceps, I pinched out and placed in separate piles a number of both crystals and grains and on subjecting them to analysis, I found them to be *selenite* and *gypsum* (*i. e.* plaster and nothing else.) In other words, Mr. De Burg does not add the requisite proport on of sulphuric acid, whereby he would get a large proportion of soluble phosphate, and makes up the deficiency by adulterating his manure with ground plaster. The proportion of neutral phosphate I will not determine; I concluded that it could not be precipitated phosphate, as it should be, but must be, the greater part of it—the original and unaltered bone black: 1st—because the adulteration proves that instead of sulphuric acid having been used in proper proportion, plaster was substituted for it; and 2nd—if it had been soluble, the use of guano or sulphate of ammonia would not have precipitated it, and rendered it insoluble. To put this matter beyond the possibility of controversy, I took a portion of the superphosphate of lime that had been prepared by myself, and to this I added some guano and sulphate of ammonia, 70 parts of the superphosphate were powdered, and made into a thin paste with 20 parts of guano, and 10 of the sulphate of ammonia, by which I got a preparation containing a higher proportion of ammonia than De Burg's ever contained. The materials having been mixed with water, even in the most favorable condition for the mutual reaction between the soluble phosphates and the substances added, and yet no *reaction, such as to make the phosphates insoluble, took place.* I determined the proportion of soluble phosphates in the manure by careful analysis and found it to be the same that I would have gotten by calculation, supposing that 30 per cent. of foreign matter had been added without precipitating any of the soluble phosphate of lime.

I conclude, therefore, that De Burg's superphosphate of lime does not now, and did not when first prepared, contain the requisite proportion of soluble phosphates; that the neutral phosphate of lime is principally, if not entirely, in the condition that we find it in the unaltered bone black, which is the foundation of the manure; and that the manure is largely adulterated with plaster. I am thus particular in stating facts and my deductions from them, because De Burg's superphosphate has generally been held in high estimation, particularly in the South.

Mapes' Improved Superphosphate of lime is another manure which has been a good deal used, and is now making loud calls upon the Southern agricultural community; large supplies of it are to be had in Baltimore, and pamphlets containing numerous certificates, analyses, etc, are freely distributed. I obtained a sample from the Baltimore agent, which like De Burg's, may be taken as a fair average of the manure Mr. Mapes and his agents offer to Southern farmers. This manure instead of being a superphosphate, is, I may say, perfectly destitute of soluble phosphates, as I could only find *traces* of phosphoric acid in the water which contained all the soluble matter of the manure. The pamphlet asserts that it contains 7 per ct. of "actual" ammonia, besides 2 or 3 per cent. of "potential ammonia." I, however, could only find 3 per cent. altogether. In filtering the aqueous solution, I found a residue of coarse particles, consisting of bone black, dirt, white grains, &c., somewhat similar to that found in De Burg's. After picking out a number of these white grains, which by inspection with a glass, it was plain was not bone dust, but some crushed mineral, I soon found them to be *carbonate of lime;* and since there are large numbers of them through the manure, I conclude that it is largely adulterated with that substance. How much soluble phosphate there was originally, it would be im-

possible to say, as the whole would be precipitated the moment it came in contact with the powdered limestone; but, when a manufacturer descends so low as to adulterate his manure with such stuff, and then sell it to farmers at $50 a ton, we may safely conclude that he will not concern himself much as to the condition of the constituents, but will make it at as little cost as possible.

Mapes says in the pamphlet, that he makes the manure of bone dust, sulphuric acid, Peruvian guano, and sulphate of ammonia, but forgets the mention of the limestone; instead of using bone dust he uses bone black, which by the way is just as good, but prefers to use the term "bone dust," because he knows that there is a prejudice against the bone black. The guano used must have been applied by way of seasoning, as salt is to food. There are several very elaborate analyses given in the pamphlet, which were made by distinguished chemists, but they are the analyses of samples *furnished these gentlemen by the manufacturer, and are not to be relied on.* The same manufactory also turns out *Mapes' Nitrogenized Superphosphate of Lime, Mapes' No. 1 Superphosphate of Lime,* and *Mape's Cotton and Tobacco Fertilizer.* I have not yet analyzed either of these manures, but would say to farmers beware of them, until you have something more than the manufacturer's statements regarding their composition or value.

From what I have said it is manifest that neither De Burg's nor Mapes' Superphosphate have any claim to the confidence of the agricultural public; of the two, however, De Burg's is far preferable, as it contains more fertilizing matter, and its price is considerably less than that of Mapes'.

I have also examined a superphosphate made in Richmond, and sold at the modest price of $40 per ton; it does not contain any soluble phosphates, and the neutral phosphate of lime present amounts to but scant 18 per cent; it contains also about 25 per cent. of plaster, and 17 per cent. of *water,* with a superabundance of *wood ashes,* and a seasoning of about 1 per cent. of salt. The condition of the manure shows very clearly that a very considerable portion of the bone phosphate was never acted upon at all by the sulphuric acid, and what little superphosphate was formed, was precipitated the moment the ashes came in contact with it. At the present prices of bones, sulphuric acid, salt and ashes, this manure could not have cost the maker more than from $20 to $22 per ton, and yet he sells it at $40. From all that I can learn I am satisfied that the great inferiority of this manure is the result of ignorance and want of skill, rather than a deliberate attempt on the part of the manufacturer, to defraud the agricultural community.

Last summer, Prof. Johnson of the Yale College Analytical Laboratory, analyzed eight samples of superphosphates of lime from five different manufactories, and out of these eight, "only two, viz: De Burg's No. 1 ammoniated, and Eve's Improved, were manufactured with any respectable combination of knowledge and honesty, two indispensable requisites for this kind of business. And these manures contained respectively but 2½ and 4½ per cent. of soluble phosphoric acid. Hildreth's superphosphate (New York) contained 5½ per cent. of phosphoric acid, and of this none was soluble! In face of these facts, he is a bold man who now buys superphosphate of lime."

Hildreth's superphosphates, summarily disposed of by the Prof., is advertised in the American Farmer of Baltimore, and a letter from Dr. Jackson of Boston, is published in which he states that the manure contains 24 per cent. of soluble matter, a large part of which we are led to infer is phosphoric acid.

These examples are sufficient to show that very few, if any, of the superphosphates in our country are genuine, and that farmers should exercise the utmost caution in their purchase. Farmers are frequently recommended to protect themselves from frauds and high prices, by purchasing the materials and making the manure for themselves; and full directions for the preparation of superphosphate of lime, have been given in most of the agricultural journals. For myself I cannot think such a course advisable; besides there are very few farmers who can be induced to adopt this plan. The farm is the place for making compost heaps, and for saving stable manure, but not the place for the preparation of mineral manures; and if superphosphates are not to come into general use until farmers make them, the

day of their popularity is still far distant. It seems to me that the most effectual remedy against frauds, would be, for all farmers who feel at all interested in the matter, to inform themselves as to what they ought to expect in the purchase of a superphosphate; and refuse under all circumstances, to purchase any article which on analysis will not come up to the standard thus fixed upon.

There is a mode of treating bones which deserves more attention, in my estimation, than it has heretofore received. If bones and wood ashes are thrown together, and kept for some months, the ley from the ashes forms soap with the fat, which is readily removed by water, and the bones themselves soften so much, that if they are thrown into the compost heap and then on the soil, they soon break down and become thoroughly incorporated with it. If finely broken bones, or bone dust is used, the softening process is more complete, and the mixture becomes a very active manure. The potash, besides removing the fat, which, when bones are used, protects them from the action of the solvents of the soil, has a strong affinity for the phosphoric acid, and takes a portion of it away from the line, forming soluble phosphate of potassa, leaving the remaining phosphate of lime in a porous condition, and capable of being much more readily acted upon by the solvents of the soil than when in the form of simple bone dust.—Such a manure would be very cheap, and when mixed with manures containing ammonia, would, I am satisfied, be more efficient than many of the so called superphosphates.

WILLIAM GILHAM.

Virginia Military Institute,
Feb'y 23, 1857.

Farming in Jefferson County, stated in the Form of Account.

March 19th, 1857.

Mr. Editor:—I believe I have been your humble subscriber since the commencement of your valuable agricultural journal, and have read many communications which alone have paid me fully for my subscription. None however have interested me more than those headed—What Kentucky can *do* and what Rockingham can *do*.

Interesting and instructive as they are, there is one point omitted in both communications which, in my humble opinion, above all others, should be known. It is this, what per cent. are those farms producing, deducting all agricultural expenses? Being desirous of information, and at the same time willing to give it when in my power, I have thought it not amiss to give you a brief synopsis of what some of us are doing in Jefferson county, Va.

Your humble correspondent was born and raised upon a farm in this county, and in 1849 bought 425 acres of limestone land at $54 25 per acre, - - - $23,056 00
Also have invested for farm purposes, personal property to the amount of - - 5,500 00

$28,556 00

Number of acres of cleared land, - - - 355
Number of acres of timber 70

425

My fields are all surveyed, and I have a plat of the whole farm.

Not being satisfied with working in the dark, I commenced in 1851 to keep a farm journal. I have relied on wheat, corn, grass, and clover seed as staple productions. Also have raised beef, pork, and mutton for market.

I find, in referring to my journal, that I have planted upon an average 80 acres of corn per year, commencing in 1851 and ending in 1856, which corn averaged 40¼ bushels per acre of shelled corn. The worst crop being in 1854, only 16 bushel per acre; the best in 1855, averaging 59 bushels of shelled corn per acre.—During the same time I have seeded annually 150 acres in wheat, which has averaged 17 bushels per acre, being fallow, stubble and corn land. Best yield of wheat being on 40 acres of fallow ground in the year 1852, 32½ bushels per acre.

Also raised oats in 1855, product between 50 and 60 bushels per acre. Product of meadow for same time 2 tons per acre.

Have at this time on farm, March 19, 1857—Cattle of all ages 48 head; horses, mules, and colts, 14; sheep, 45; hogs, 67. Keep more cattle in the winter season than in the summer.

Work 6 men and 1 boy on the farm, and occasionally employ extra labour. Average agricultural expenses per year for 6 years being store bills, taxes, labour and all bills for farming purposes, - - $1,168 00
Average net profits (per year) for 6 years, after deducting all expenses, - - - 3,232 00
Interest on $23,056, at 6 per cent. - - $1,383
Interest on $5,500 of personal property at 10 per cent. - - 550

$1,933

Whole investment paying 10 per cent. on first cost of farm.

Present value of farm from $75 to $85, having expended $1,100 in farm buildings. Have never used 500 weight of artificial manures, relying mainly on barn-yard manure, clover, and plaster as fertilizers.

I have not charged, or given credit for what has been consumed on the farm in the form of corn, meats, provisions, &c.

Respectfully yours,
A SUBSCRIBER.

Jefferson County, Va.

The Game the most Profitable Breed of Stock.

I well know the sentiment here advanced will meet with many who will doubt its truthfulness. Some will imagine they can, from their experience, prove to the contrary. I will ask, have you ever raised the game with your brag fowls, the same year and under the same circumstances? If not, then you must hold your peace.

Others know it is false, for naturalists say of all fowls the game is the most barren. In reply to this, I will say the fowls we now get from England as game, are *very* different from that barren stock which Goldsmith says "will not cluck more than one brood of chickens a season."

I will now prove that I have not jumped at conclusions, by showing that I am well fixed for raising more than two or three species of fowls the same year. And secondly, that the treatment is the same with all.

In the first place, I have eight hen houses, four separated by a paling fence, the others by distance. In each hen house I have the boxes for nests made of plank twelve inches wide, with partitions ten inches apart; the nests are made three times a year, of nice grass and trash tobacco; the feed is alike at every lot; the fowls, being of a different breed at every lot, all have the same attention paid them. They are well fed, and have water in the summer twice a day; and in every lot I have calcined bone for them to eat, as they cannot get lime enough in the lots.

I like to set as many hens as possible in February and March, though I never put more than thirteen eggs at this season under a hen unless she is very large, for in cold weather the eggs should come in contact with the body of the hen, to insure a good hatching.

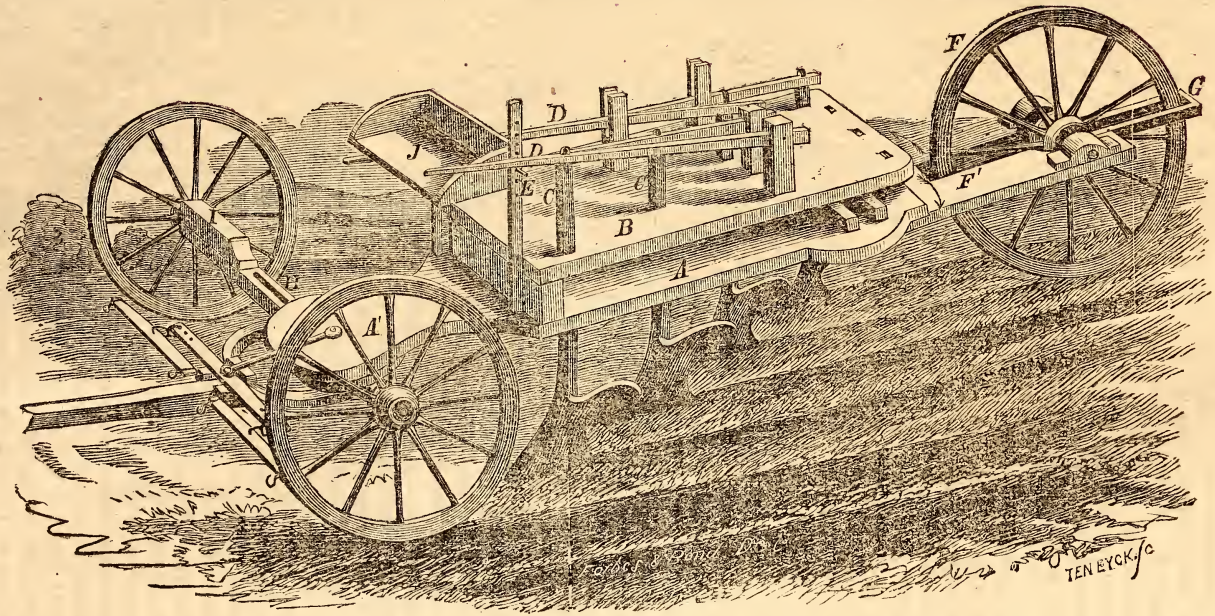
After the chickens are hatched I put them with the hen in a hovel, and keep them stopped up for two or three days, unless it is warm weather; then they may be turned out for three or four hours a day, until they are strong enough to follow the hen. Some trash tobacco should be put in the hovel, and if they have vermin, grease the hen with lard and spirits turpentine stewed. The chickens should not be greased unless they are covered with vermin and over a week old. I feed three times a day with dough made up with grease from the kitchen. Now this method is followed at every lot, and I can truly say the game will compare favourably with any other breed of fowls I ever saw. To show I believe what I write, I have *this* year seven kinds of game, and with the exception of one stock, they will lay as many eggs, set as well, and raise their young better than any fowls I have ever seen.

I know it is said the game do not grow fast enough, for chickens hatched the same time, of the larger species, such as the Shanghai, Chittagong, or Black Spanish, will be a fourth larger at the same age, or by the time the first named are large enough to eat. I admit this: but the price commanded by the game will, when they are marketably, justify you in keeping them a week or so longer, and this is not all, for the game may be sold to amateurs from $2 to $10 per pair. Many are prejudiced against the game on account of their fighting qualities. If you turn out two or three young cocks the same year, they certainly will have a battle the next spring. But I would advise all who can to build two hen-houses, and put a dozen hens and one cock in each, I will insure it if you pay any attention to them, you will get more eggs, and raise more chickens than you commonly do by having thirty or forty hens crowded in one hen-house.

I will close by asking for this a place in your paper, and in the future I will write an article on breeding in and in, and go into the rearing of fowls more fully.

I am yours, respectfully,
J. McL. ANDERSON.

BAKED TOMATOES.—Tomatoes, pealed and baked on a flat dish, as we bake apples, (or even baked without pealing), when done seasoned with salt, butter and pepper, is, we think, the most luscious way of preparing this excellent fruit.



SMITH'S PATENT SINGLE OR GANG PLOW.

The above cut is a representation of "*Smith's Patent Plow,*" a Western invention, to which the attention of farmers, mechanics, and the public generally, is respectfully invited. It is worked by two or four horses, or oxen, and is called a Single or Gang Plow, for the reason that it can be used with any number of plows from one to four. It is adapted to any kind of plowing in any kind of ground. When used for breaking up prairie or meadow ground, colters are attached in front of the plows; in subsoiling, the subsoil plows stand immediately behind the others; in turning in wheat, or other small grain, two or four small plows are used; in common breaking, from one to four are attached. It can be adjusted to turn up any depth of ground less than twenty inches. With four horses it can be made to break six to eight acres of common ground per day. The driver sits comfortable on top and can adjust and re-adjust the plows without moving his seat. This Plow has been exhibited in competition with the modern improvements in plows, and has secured thus far a very flattering preference, and has been awarded *Two Highest Premiums.* The plows may be removed, or changed from large to small plows with great facility. The hind wheel supports the back end of the machine and its frame, and is fastened to and permits the machine to make a very short turn.

For any further information respecting the above improvement, please address T. S. SMITH, *Troy, Madison Co., Ill.*

From the British Farmers' Magazine.

Lecture on Agricultural Chemistry.

BY MR. J. C. NESBIT.

On Tuesday, Nov. 11, 1856, a lecture on General Agricultural Chemistry was delivered in the Central Subscription Rooms, Launceston, Cornwall, by J. C. Nesbit, Esq., of the Agricultural and Chemical College, Kennington, in fulfilment of an engagement entered into by him with the committee of the Launceston Agricultural Society.

In consequence of the lecture being delivered in the evening of the day on which the cattle show was held, and immediately after the dinner, the attendance, which amounted in all to about two hundred, comprised a very large proportion of the members of the society and the leading farmers of the district. The lecture was illustrated by the use of tabular diagrams. The chair was again taken by C. Gurney, Esq.

Mr. NESBIT then came forward, and said:

* * * * *

Allow me in the first instance to point out to you what I have termed "the application of science to agriculture." Agriculture, as an art, has existed time immemorial. Our fathers and our grandfathers and our great grandfathers, and all our ancestors before them, ploughed the land and harrowed the land and tilled the land; they obtained crops and realized certain results from certain operations—in our country one way, in another country in another way. But the facts of their art, however numerous and important, had never been collected—had never been strung, as it were, together; they were like the beads of a necklace, each unimportant by itself, but when strung together forming an important whole. Now the application of science to agriculture at the present time is to collect the facts of agriculture, facts with which you have become perfectly familiar in your own experience, and to show why certain causes produce certain effects; and I believe I shall be able to point out to you something to-night which will enable you to trace some of the facts with which you are yourselves acquainted, to certain simple and definite causes. The first point to which I shall direct your attention is the nature of soils, because I think that before we commence any investigation into the nature of plants we should know something about the character of the soils in which they grow. Viewing our planet as a whole, we may regard it as consisting of earth, or solid matter; water, or liquid matter; and air, or gaseous matter. These three kinds of matter are quite capable of changing their form. The solid may become a liquid or a gas, the gas a liquid or a solid; and a liquid may become either the one or the other. The particular mode in which any of these forms of matter is presented to us depends upon heat; so that, you see, the old myth of the ancient philosophers, that fire, air, earth, and water are the four elements, is not in reality so very far wrong. Taking a broad and general view, it may be affirmed that the solid matter, the liquid matter, and the gaseous matter, aided by the light and the heat of the sun which acts upon all these, are the great elements upon which the animal and the vegetable existence of the whole world depends. Now in this county (Cornwall) we are blessed with a very large amount of a certain rock called granite, which is regarded by geologists as the primitive rock of the world, containing within itself the material from which most of the other rocks have been derived by action of some kind or other upon its surface. This granite, supposed to be the primeval rock, has been subjected to the operation of certain causes. Now granite rock consists of certain substances which are subject to the action of the air.—Without mentioning at the present moment those properties of the air which act upon granite, let me point out to you that one of the chief ingredients in granite is feldspar, which is found in all the granite in Cornwall. This contains 65 per cent. of a substance called silica, which you know very well under the name of sand. I am not speaking now of the shell-sand of the coast, but of the hard, gritty, silicious sand. It contains 18 per cent. of a substance called alumina, which is the base of clay; a pure alumina is, in fact, a pure argillaceous matter. It also contains a substance called potash, to the extent of about 16 per cent. Now nothing at first sight appears more indestructible than granite rock. But there is abundant evidence that granite is very destructible, especially

if it contain a large amount of feldspar. Porcelain clay, which is found in such large quantities in this county, is obtained from the decomposition of granite, and what is called china-stone is simply granite partially decomposed. Now what is the nature of the action of the air in this case? There is a certain principle in the air called carbonic-acid gas, which acts upon the potash in the feldspar, and dissolves it out; and of course, the effect of dissolving the potash is just like that of taking the mortar out of a wall—the other materials fall to pieces. If in the district of St. Austle parties did not wash out the clay in order to use it for various artificial purposes, the rain which falls from heaven, and the continual action of the air, would eventually produce the same result. And without entering into any description of other substances similar to feldspar, I would simply observe that the general origin of clay soils in the decomposition of substances containing alumina in quantities. While you find the alumina which is a very light substance, washed down into one part, you have the silicious matter washed down into another part; and this disintegrating and washing process on different rocks goes on until you get every variety of soil that can be conceived, from a clay to a sharp sand. Well, now, having seen that soils owe their primary origin directly to the disintegration of rocks, of which there is such an abundance in Cornwall, let us now proceed to consider the effect of atmospheric action upon soils themselves when they have been formed. Now, gentlemen, there are certain substances in the soil, which are, as I have before intimated, soluble: potash, soda, lime, magnesia, phosphate of lime, &c., are some of them. These substances are continually acted upon in the soil by the air—that is to say, they are liberated from their insoluble combinations in a soluble form, provided the air acts upon them; while in the absence of atmospheric action they are not rendered soluble. Thus we at once see the necessity of exposing the land to the air by ploughing, by harrowing, and by every other mechanical means that is suitable, in order to secure the liberation of those substances which are essential to the growth of plants. In order, gentlemen, that the soils of any given district may be properly tilled, it is necessary that they should be regularly exposed to the action of the air, that they should be properly drained, and that if lime be absent it should be supplied in sufficient quantity. Let me—taking these points in the order in which I have mentioned them—first speak of the action of the soil upon the air. Every substance—a piece of chalk, for example, has a certain amount of surface, and the surface of every solid body attracts air and moisture. It has been proved that there is more air and more moisture within the 100th part of an inch from the surface of this glass [holding up a tumbler] than within the second 100th part; the truth being that the surface of any solid body attracts aëriferous matter. You would hardly imagine, but it is nevertheless a fact, that a piece of charcoal like this [exhibiting a piece] would, if exposed to ammonial gas, absorb 90 times its own volume of that gas. This piece of chalk has now a certain surface. If I break it, it will have two surfaces; if I break it again, it will have two more. And as the absorbent power of any substance depends upon the extent of surface, so, you perceive, the more you pulverize your land the greater must be the extent of surface which you expose to the action of the air. (Cheers.) Every division that you make exposes a greater amount of surface, and the finer the division is, or, to use a phrase which is common in another part of the kingdom, if not here, the finer tilth you make, the better the land will be adapted for the growth of plants. I again repeat, all solid bodies have the power of absorbing the liquid and gaseous bodies which are found in the air. Thus you have the ammonia absorbed from the air; and all the other materials in the air which are required for the proper development of the plant—you have all these absorbed by the finely pulverized soil, and you have that soil at the proper time liberating those substances for the roots of the plant. Let us take a case in point—a case which will serve to illustrate the necessity of stirring up the land in order to its proper cultivation. I will suppose that you have a field of turnips. In such a season as the last, when there was a considerable amount of dry weather, you might perhaps have considerable amount of dry weather, you might perhaps have considered it was not

desirable to practise horse-hoeing at such a period—you might have supposed that loosening the soil between the turnips would let in heat to the roots of the turnips, and dry them up. Now, gentlemen, remember that, if you have no rain coming down in the day, you have dews falling at night; and let me tell you that to have a thoroughly-pulverized soil, and to keep continually exposing it to the action of the air, is the best mode of absorbing the greatest obtainable amount of dew from the air, so that during the very best portion of the day the plants may have a certain amount of moisture, which they have taken from the air in the night, to sustain them. Let me, then, recommend to you the stirring and horse-hoeing of your root-plants during dry weather, if you wish to secure the greatest development for them which is attainable under such circumstances.

* * * * *

I now go on to speak, therefore, of the use of lime. This is a matter of considerable importance to all western farmers.—Throughout the eastern and the midland districts of England lime is found very generally disseminated, not only in the limestone rocks there, but also throughout the clay soils; and, consequently, the application of it to the land is not required there to anything like the same extent that it is here. On the other hand, in those soils which prevail toward the west, lime is, as I know from my own analyses, found generally only in very minute proportions, and then not always in the condition in which it ought to exist in the soil in order to develope its best characteristics and powers. Hence the large amount of lime which has been found practically useful here in the form of simple lime; and further to the south and the west in the form of shell-sand, which is carried on to the land in large quantities. Now, the action of lime, gentlemen, is this: it helps to liberate a certain amount of the insoluble materials in the soil, which would otherwise not be liberated within the same period of time. If I were to powder a piece of feldspar, mix it with common water and some lime, and then leave the whole for a twelvemonth, I should, at the expiration of the period, find a much larger amount of potash liberated through the action of the lime than could have been liberated had there been no lime. So that lime, you see, produces a very powerful effect in liberating and making soluble some of the mineral ingredients of the soil. It also operates powerfully in relation to the dead vegetable matter which exists in the soil, helping it to assume the form in which it is best adapted for the production of vegetable life. Let me mention a case which will serve to illustrate how powerful is the effect of the use of lime. A few years ago, having had some soils at Exmoor sent to me for examination, my report upon them was this: "You may use guano, you may use superphosphate, or anything you please to stimulate production; but if you do not also use lime the result will not be satisfactory; lime is the first essential, and after that has been applied, you may have recourse to artificial manures." Well, a twenty-acre field, on Exmoor, cultivated by Mr. Smith, the well-known and intelligent steward of Mr. Knight's property was pared and burnt, and lime was applied to all but about an acre, where, in consequence of there not being enough lime brought up for the whole, none was used. The whole of the land had guano applied to it, and the turnips were drilled with superphosphate of lime. To one inch, where lime was put, there was a beautiful crop of turnips; and to one inch, where no lime was put, there were no turnips at all.—This is a case which clearly proved necessary is the presence of lime. But, gentlemen, if I were to tell you that you might go on liming year after year without doing anything else, I should be saying what might lead you into a very great error.—Lime ought to be regarded by you as an *amendment* to the soil, not as a *manure*.—You ought to consider lime as a substance to be added to the land occasionally, chiefly in order to ameliorate its condition, and render it better adapted for the application of manures, though of course at the same time it supplies a certain amount of lime to the plant itself. You should on no account apply it indiscriminately, and to any amount. If you do that, you will bring your land into a bad state, and will lose a certain amount of income—a result which is to be carefully avoided in these days of high rents and taxes. In order to proceed on the right basis, you must, as I have before intimated, view lime in the light of a

substance to be used occasionally, and not in place of a proper and continual supply of manure. I have mentioned this matter thus minutely because I know there is in many places a very great want of a proper understanding with regard to the use of lime. If you have enough lime already, to apply more is like sending coals to Newcastle, or throwing them into the sea: the addition of more will produce no effect.—I know that many of the farmers in the southern and western parts of Cornwall have declared that they do not like using shell-sand, because they do not find it to act in the land. I have discovered by analysis that this view, at least in some instances, is correct—that many farms have got enough of this extraneous matter already. When such a substance has been carted on the land year after year for perhaps two or three hundred years, it is but natural to suppose that there is now sufficient calcareous or limy matter for the purposes of cultivation, and that the period has now arrived when, if other substances are applied, the land will, in consequence of the presence of lime in adequate quantities, be perfectly prepared to make the best use of them. I must now speak to you, gentlemen, of vegetables, or the various crops which you grow. What are they, and what do they contain?—Without speaking of the vegetables which grow in the sea, and which only require roots for the purpose of being attached to rocks, and having a hold there, I may observe that the vegetables which are cultivated on the farm are found to have a root and a stem, or at all events to have a portion which grows in the land and a portion which grows out of the land. That portion which grows in the land, and which is called the root, serves two purposes: it serves as a holdfast for the plant in the land, and it also serves, by means of the little pores which are found throughout the root, to absorb those matters from the soil which the plant requires for its development. The plant also sends leaves into the air, and these act by absorption upon any materials contained in the air which may be essential to the plant. Now, gentlemen, if you have been in the habit of considering that plants derive all their materials from the soil, you have been in the habit of considering wrongly; for they derive on the average nine-tenths of their weight from the air, into which the leaves shoot, and about one-tenth—and many of them very much less than that—from the soil in which they grow. It is on this point that I wish now especially to address you. If I burn this piece of paper (holding it up,) paper in fact a vegetable, the ash which is left behind is what came from the soil: that is called the mineral or inorganic matter, consisting of the phosphate of lime and the potash, and the other materials which the plant may happen to have derived from the soil.—All that which burns off and goes into the air was derived originally from the air.—So that this analysis is exceedingly simple. That which does not burn off, viz: the ashes, originally came from the soil; that which burnt off, came from the air.—Now, gentlemen, I wish to speak to you of those materials which plants derive from the air, and from the water which comes down from the air. There are only four substances which plants derive from the air, and, though I am very much afraid of introducing too much chemistry, I must give you some account of each of them. One is called oxygen another is called nitrogen, another hydrogen, and another carbon or charcoal. I must, I say, endeavour to convey to you some idea what these four substances really are. I am probably addressing many persons who are as well acquainted with these substances as myself; but I think it best to go to the bottom, in order that none may be without the requisite information.—Here we have, then, oxygen, nitrogen, hydrogen, and carbon. Now let us begin with oxygen. Oxygen, gentlemen, used to be called vital-air, because animals are absolutely dependent upon it for their life: they cannot exist without it. If we were deprived of the oxygen which is found in the air, we should all die by suffocation. Death by drowning is nothing else than the cessation of breathing for want of the vital power in the air. Common air contains oxygen in the proportion of one-fifth, that is to say, five bushels of air contain one bushel of oxygen. This substance in air is diluted by another substance, called nitrogen; and if it were not so diluted, we should be placed in considerable difficulty, because it is so powerful a burner, so strong in its action; that it would burn everything up. If I had a jar of oxygen,

and were to introduce within it any burning body, you would immediately see the combustion increases to an enormous extent. I have got a little oxygen in a glass on this table, and if it has stood the journey from London you will see the effect which I have mentioned. [A piece of ignited wood was here inserted in the aperture of the glass, where it burnt with greatly increased intensity.] The increased intensity is entirely owing to the oxygen. This substance it is which serves to burn up all our fuel. You can now understand why, if oxygen were not diluted by four times its own volume we should be incapable of existing. Everything would then be burnt as quickly as a piece of paper when put in the fire. Now let me introduce into a jar of oxygen a piece of ignited charcoal or carbon, which I was speaking of, in order that you may see how much more brilliantly it burns there than it does in ordinary atmosphere. [Experiment performed.] The produce of this union is called carbonic acid or charcoal gas, and of its properties I shall shortly speak. Well, now, gentlemen, after what you have just seen, you cannot be surpised when I tell you that this substance, which is always found in the air, is most active in the decomposition of manure-heads and of animal vegetable matter generally. To this point it is my intention to allude further in an after-part of the lecture. Well, now, oxygen is also found in water. Water consists of hydrogen, one of the other elements of which I spoke, and oxygen. You must bear in mind the difference between these two substances. Oxygen is the body which consumes everything; hydrogen is one of the substances which is burnt. All tallow, all oils, all wood, all things generally which burn with a flame contain hydrogen. Hydrogen is, as I have just stated, found in water, and it can be liberated from water with perfect ease. Water, as I have just told you, consists of oxygen and hydrogen.

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I have now spoken to you of oxygen, which is the active burning principle of the air, and one of the constituents of water; and of hydrogen, which is the other constituents. Let me now speak of nitrogen. Nitrogen exists in the air to the extent of four-fifths of the entire bulk. It is in itself very inert, having no particular action by itself. Some of its combinations are very curious. For instance, nitrogen and charcoal, with some hydrogen, forms the powerful poison called prussic acid. Saltpetre, which contains nitrogen, mixed with sulphur and charcoal, forms the gunpowder by means of which men blow each other to pieces, and, in fact, nitrogen is found in almost all our powerful explosive compounds, such as fulminating silver, gun cotton, &c. Nitrogen, existing in nitrate of soda and guano, is, however, used for the far different purpose of assisting in the growth of the farmer's crops. So far, however, as the farmer is concerned, what it is chiefly necessary for him to know is the main constituent of ammonia, and of nitrate of soda, and of guano, which are all so very valuable to the cultivator of the soil. I now come to carbon or charcoal. I gave you just now an example of the burning of charcoal, but I did not point out the properties of what was then produced by the burning of the charcoal. Has it never struck you that when coal or wood is burnt, nothing but the ashes seem to remain? What has become of the bulk of the materials? It has passed into the air in an invisible form; and, so far as the charcoal is concerned, that portion has passed into the air in the form of a substance which is commonly called carbonic-acid gas, but which we will also call charcoal gas.—Now carbonic-acid generally exists in the form of a gas; it comes out in the form of an effervescence in bottled beer, in champagne, or in soda-water; and it is also given out in the burning or decomposition of any animal or vegetable matter containing carbon; and when I tell you that it is this carbonic-acid gas that kills so many men who incautiously descend into wells or brewer's vats, and that it is, in fact, identical with what is termed choke-damp by miners, you will admit that it is a most important agent wherever it is found operating. Let me now exhibit to you one of the effects of this gas. It is a substance which has the power of uniting with lime-water, and forming a white sediment, which is, in fact, carbonate of lime, or chalk. I will take the bottle in which I burnt the charcoal in a previous experiment, and will introduce some lime water; on agitation you will

observe that the lime water, which at first was transparent, is now white like milk, [Experiment performed. Mr. Nesbit then showed by similar experiments that carbonic acid was given off by burning wood, paper, wax, and other similar bodies containing carbon.] I may here observe that we ourselves, and other animals, are all like so many steam-engines. We are obliged to take in so much food every day to maintain the animal heat, and to keep the machine in motion; by every inspiration we take in oxygen, and by every expiration we give out carbonic acid, which is derived from the combustion of the charcoal of the food which we have eaten. If I pass the breath from my lungs into this lime water, you will find the same kind of deposit that you have before observed produced from the gas proceeding from the burning of charcoal. [Experiment performed.] So that you see, gentlemen, whatever may be the manner in which charcoal or carbon is burnt whether it be burnt in the form of charcoal itself, or as it exists in paper, or wax, or tallow, or as food in the animal system, the result of the combustion is carbonic acid gas. Now, in order that the properties of this substance may be well impressed upon your minds, I shall place it before you in tolerably large quantities, and will endeavour to show you some of its properties. I have here a quantity of chalk, which is carbonate of lime—that is to say, a combination of lime with carbonic acid. I dare say many of you have heard of poor unfortunate people sleeping near lime kilns, and being killed by the fumes which came from them. Those fumes consisted of carbonic acid. Now, I can liberate the carbonic acid in an easier way from the carbonate of lime than by heating it; all I have to do for that purpose being to put a stronger acid to the carbonate, when the strong acid will take the lime, and the carbonic acid will escape. The acid I shall use is called muriatic or hydrochloric acid, or spirits of salt, and I shall now put it over the chalk in this jar. [Experiment performed.]—You here see a very considerable effervescence, which is caused by the liberation of the carbonic acid. Now, carbonic acid, gentlemen, is one and a-half times heavier than common air, and that is the reason why it collects at the bottom of wells and pits, and other places of the same kind. We have it now collecting in this vessel [pointing to the large glass jar;] though we cannot see it, it is certainly there. I speak of carbonic acid; I speak of what is contained in the apparently-empty space above the liquid in the jar, I will send down into the jar what I may call a little searcher [referring to a little ignited wax taper at the end of a wire;] and as soon as this searcher comes in contact with the carbonic acid gas in the jar (which may represent a well containing this gas), the light will go out.—[The flame was here let down into the jar, and was instantly extinguished.] If a man were to go down into a well of the same kind, his life must go out just as that flame went out; for what prevents the combustion of a candle would prevent combustion in a man; the man's life would be as utterly extinguished as was that flame. But I have to show you also that this gas is identical with that which I have previously produced by the burning of charcoal. [Some of the gas was here poured into a vessel containing lime water, and the white precipitate of carbonate of lime was immediately produced.]—Now, gentlemen, I have been the more more particular with these experiments upon carbonic acid because, although the thing is invisible to your eyes, it is nevertheless quite capable of proof that it is from this gas that every one of your vegetables derives the whole of the charcoal which they contain. I have just one more experiment to make before I proceed. If I take this glass, containing carbonic acid, and pour the gaseous contents over one of these candles, I have not the slightest doubt that the candle will go out. [Experiment performed, the result being what was intimated it would be.] I must now endeavor to give a practical turn to the subject matter of the lecture. I have endeavoured to point out the nature of the soil and the effect of drainage upon it, and the necessity of keeping it in a pulverised form, in order that it may be in a proper state to absorb moisture, and to appropriate the various substances contained in the atmosphere. I have also described the four substances which constitute the organic matter of plants—the oxygen, which burns; the hydrogen, which is burnt; the nitrogen, which is found in saltpetre and nitrate of soda, and the

charcoal, which, when united with oxygen, forms carbonic-acid gas. With regard to this last, I may add that it is found in the air, in the proportion of one part to every two or three thousand; and from this source it is that plants derive all their carbon. It will perhaps be our best course to direct our attention now to the nature of plants. As I before remarked, vegetables have roots and leaves. Their rootlets go down into the soil, and thence obtain the nutriment in the soil; their leaves go out into the air, and there seek the nutriment which is contained in the air. Now it is a curious fact, that when the light of the sun, or the diffused light of day, is shining upon the leaves of plants, these leaves have the power of taking in carbonic acid gas from the air, of retaining the charcoal or carbon of the carbonic acid, and the hydrogen of the water, within themselves, and of giving the other constituent of these substances—viz: oxygen, or vital air—back again to the atmosphere. However strange this may seen, it is nevertheless true. One single experiment will suffice to prove this. If you introduce a sprig of mint into a bottle of water containing carbonic acid, you will, after exposing it for a time to the light of the sun, find it covered with little globules; and if you collect all these into one globule at the top, you will find pure oxygen gas. Another experiment is that of a celebrated French chemist, who placed a living branch of a vine in a glass tube, and then covered the tube all over with blackened paper, so that no light could penetrate, and he sent a current of air through it containing about five per cent. of carbonic acid gas. He sent this through the tube, and did not expose it to the light.—He found that the tube at the other end, which passed through lime water, gave an abundant precipitate, showing that the leaves had no action on the charcoal gas. He then took off the paper and exposed the tube and vine branch to the light of the sun; and on now sending the stream of air and carbonic acid through the apparatus, not a trace of carbonic acid was found to pass through at the other end.—Another point which you have to remember is, that plants obtain the largest amount of their nutriment from the air. You shall plant a forest upon land which contains no vegetable matter, I might say, upon Brown Willy or Rough Tod; you, or some one else coming after you, may, at the end of, say fifty years, remove cart load after cart load of timber, and yet, at the expiration of the period, the soil shall be richer in vegetable matter than it was when the trees were first planted. Where did all this vegetable matter come from, if not from the air? Again, in the case of a field of turnips, it is the action of the leaves of the turnip upon the air that secures the greatest amount of vegetable matter. Bear in mind, then, that plants are dependent in a far greater degree upon the air than upon the land; that so far as the land is concerned, you can only, after a due supply of mineral matter, assist the plant in endeavoring to obtain more organic matter by its roots from the land than it could naturally obtain by its leaves from the air; and in this consists the true principle of manuring. I must now proceed to speak to you about the production of farm-yard dung. That is the *sine quâ non* of farmers, and I am afraid that some farmers attach too much importance to it, regarding it as if nothing else could possibly equal it in value. Now, gentlemen, what is farm-yard dung? I am not about to speak now of all the various modes of manuring which are adopted, though I have heard it stated that the decomposing vegetable matter differs greatly in different counties. Farm-yard dung is neither more nor less than decomposed vegetable matter, derived from plants which once had life in the soil, and which, when returned to the land, will furnish the necessary elements for reproducing vegetable life. The manner in which it is decomposed—the mode of reducing it to a proper state for its application to the land—is quite another question. Is what I have heard stated true, that in Devonshire and Cornwall there are parties who are in the habit of strewing their straw on the high roads and bye-roads? Is it true that in this county it is the practice to place vegetable matter in a position in which everything in it that is valuable is likely to be washed away? If that is the mode of making farm-yard manure which is adopted in this district, or in other districts, all I can say with regard to it is, that it is not a mode which I should recommend for imitation. Gentlemen, in considering the subject of the decomposition of vegetable

matters, you must remember that some elements of vegetables are volatile, and some soluble, and that those which are least volatile and least soluble are also least valuable. The substance in manures which is most volatile is ammonia; and where there is bad management this will pass away into the air; while the potash and the soda, and the other soluble materials, will be washed away. As compared with the practice which I have mentioned, would it not be well to put your straw in the farm-yard sheltered from wet, and place your feeding animals upon it? because, in that case you would have the dung of the animals upon the straw, and the vegetable matter also. The truth is, that every possible precaution ought to be taken against losing anything valuable that is contained in vegetable matter; and with this view you should seek to have a proper amount of moisture and no more, and endeavour to associate farm-yard manure with materials which will tend to fix the ammonia, and so on, and prevent it from passing away. Now the quality of the manure must depend on the quality of the vegetables on which you feed your animals. If you feed them merely upon straw, the value of the dung will be in proportion to that of the straw; whereas, if you add oilcake and other substances of a similar nature, there will be a proportionate increase of value. There is no ultimate action in the animal economy—no action, that is, in relation to the food which the animal consumes, that does not take place in ordinary decomposition. If you decomposed a large quantity of vegetable matter, whether it were oilcake or straw, you would have just the same ultimate result as if you passed it through the body of an animal. The animal system does not add anything whatever to its value: the animal only gives forth what it received. Indeed, so far as manuring is concerned, the dung of the animal is always less valuable than would have been the food on which the animal had subsisted. It must, therefore, always be borne in mind by practical farmers that the animal adds nothing to food, but only substracts from it. Many persons are apt to imagine that the fact is otherwise; but they are certainly mistaken. If you had more turnips than your sheep required—and I have known such an instance—and were to chop up a field of turnips and plough them in, the result would be that you would afterwards get a far better barley crop than you would have done had sheep, by eating them, robbed the turnips of a portion of their value. I have seen that experiment tried over and over again, and it has always been attended with the same result: therefore theory and practice perfectly coincide in this matter.—Well, now, with respect to the making of farm-yard manure, let me impress upon you that, so far as the quality is concerned, that depends on the food of the animal; and that in order to its conservation you must protect it against water. It is my opinion that, with the view of most effectually preserving the ammonia, you had better make a kind of compost heap, first spreading a quantity of ditch stuff, road scrapings, or other earthy matter, and then putting a layer of dung, then another layer of earth, and so on, alternating the earth with the dung in such a manner as will be most likely to cause the earth to absorb the substances which would otherwise pass into the air, and to prevent the wasting away of the soluble materials.—You will, I believe, secure a far better kind of farm-yard dung in that way than by any other mode of proceeding with which I am acquainted. It is the duty, or at least the interest, of every one to try and make the vegetable matters of the farm go as far as he can; though, however, he may aim at doing this, he will never be able to produce upon the farm all that it actually requires; and hence he will occasionally be obliged to resort to extraneous sources to supply the deficiency. I am afraid I am detaining you, Mr. Chairman and gentlemen, at too great length. The subject is such an extensive one that there are one or two other points which I desire still to introduce, but it must depend upon yourselves whether I shall do so (loud cries of "Go on.") Well, I will first mention the rotation of crops, and afterwards speak for a few moments in reference to artificial manures. With respect to the rotation of crops, I wish to point out to you a very clear and simple illustration. Taking the four-course shift as the example—though it may be expanded to six, or eight, or ten, or any number that you please—I will suppose that you have turnips and barley and seeds

or peas and wheat as your rotation. I am aware that you are in the habit of leaving seed for two or three years. I do not wish now to express any opinion with regard to that practice; but I will just state what I consider to be the true theory of crops, taking the four-course system as the rule, and bearing in mind that it may easily be expanded. After draining your land, and getting it into proper condition, you sow it for turnips. Now turnips are plants having a large development of leaves. They send their roots downward in search of nourishment; they send their large leaves into the air. With every breath of heaven that passes over the plant, the leaves absorb the carbonic acid of which I have been speaking; they give out the oxygen, and retain the carbon; they absorb the ammonia from the air, and their roots draw up from the soil the mineral matters; and these, uniting together, are the sources of the materials which the turnip stores up in the form of its bulb. The turnip intends, from these accumulated materials, to produce turnip seed. But you, gentlemen, step in and say—"We don't want turnip seed; we want mutton or beef." And in order that you may have these, the turnips are eaten by your sheep or bullocks, and the manure produced is used for obtaining a crop of barley. I know you do not feed sheep here to so great an extent as they are fed in the eastern part of the kingdom, but the argument is still the same. The matters, therefore, which the turnips obtained from the air are employed in producing more barley than the land would produce naturally. Barley being a narrow-leaved plant, you obtain for it, by means of the turnip plant, a large amount of the substance which barley most requires; this is put into the soil and taken up by the roots, and is assimilated by the barley. the result being that you produce four or five quarters of barley instead of the one or two quarters that you would obtain naturally. So that you employ, in fact, the great absorbing powers of one plant to assist the smaller powers of another.—You must recollect, however, that if the relative prices of the productions were different, the whole of your operations would be different, so artificial and relative are the processes of agriculture.—Well, with respect to clover, although clover is not a plant with large leaves, it is a plant of great foliage, and every little leaf that it sends into the air sends a rootlet downwards; so that in exact proportion to the amount of foliage above the ground will be the quantity of the roots below.—Well, then, supposing it possible that you are constantly feeding off clover in the spring, I would remind you that every time a sheep bites a leaf off, it stops the growth of the rootlet connected with that leaf, for each leaf has its corresponding rootlet; and as it is the roots below that furnish increased nutriment for the wheat, so if you do anything whatever to stop the growth of the roots, you to that extent diminish the amount of the wheat crop which you intend afterwards to get from the land. Now if, instead of feeding off the clover, you were to cut it twice, removing the hay each time, and were then to plough the roots into the land and well work them, you would, I am sure, get a larger amount of produce from the land than you can possibly obtain under the system of feeding off. Gentlemen, this may be new to some of you, but it is not the less true. I will give you an instance—I might give you fifty. A friend of mine in Northamptonshire had a field of twenty acres of clover. It was all cut at Midsummer, and the hay removed; one-half was subsequently fed off, and the other was allowed to grow until September when it was cut, and a good crop of hay was removed from the land. A portion of each part of the field was then dug up, and the clover roots separately weighed. Where it was cut once and fed once, there were thirty-five hundred weight of roots per acre; where it was cut twice, there were seventy-five hundred weight of roots per acre—being a difference of two tons of valuable vegetable matter in the soil in favour of the land where the upper growth had been twice cut and wholly removed away. It is, you perceive, the decomposition of the clover roots in the land which furnishes the additional amount of manuring matter necessary for the intended increased crop of wheat. Having now said all I intended to say with regard to the rotation of crops, I proceed to say a few words with respect to the use of artificial manures. I am persuaded that there is no part of the country which is more likely to derive benefit from the application of artificial manures than Cornwall.—

Owing to the hilly character of the district, there is great difficulty in carting farmyard manures, even if it could be produced in adequate quantities; and I need not tell you that, where you have to put ten or fifteen loads per acre, the expense of cartage must be much greater than it would be if you could obtain the same result with one load of another manure. What I have now said indicates, in some degree, the position in which you are now placed. I am certain that in the next five years the agriculture of Cornwall will receive an impetus such as it has never experienced hitherto; because the Cornish farmers will now be enabled to grow abundant crops, with the aid of artificial manure, in places where manures hitherto have, in consequence of their bulk, been practically unattainable. But let me tell you, gentlemen, that you have to guard against adulteration. I have myself spent a great portion of my time in exposing the various adulterations of manures. I have, too, recently met with an instance in which parties, calling themselves a company, have presented themselves before the world as being associated for the special purpose of protecting the interests of that unfortunate being who is supposed not to be capable of protecting himself—the British farmer (laughter); and these gentlemen declared that by them, at least, no adulteration should be sanctioned. Gentlemen, a guano which was offered by these parties to the British farmer at about £10 per ton—the price of genuine Peruvian guano being, you will observe, £12 per ton—was ascertained by me on analysis to be worth only about £2 10s. per ton; while a quantity of superphosphate of lime, which was offered at £7 per ton, was also ascertained to be worth only about £2 14s. per ton. These analyses were made within the last few weeks. Of course, these adulterated articles were sold to some one, and it is as likely, perhaps, that they will be offered in the West of England as in any other part of this country. (Laughter). All I can do is to recommend you to take proper precautions against imposition. Imitate the conduct of honest manure dealers who never allow anything to come into their manure works without knowing what it is. Never allow, if you can help it, a single artificial manure to come upon your farm without having ascertained previously of what it consists. The cost of an analysis is very small compared with the loss which you would sustain by using a spurious manure to assist you in the growth of your crops. If we could only induce the farmers to join us in this work of detection and to have their artificial manures analyzed, the whole tribe of dishonest manure dealers would vanish from the face of the earth as quickly as so many mushrooms.

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The Chairman said he concurred in almost everything the lecturer had said. He saw considerable doubt depicted in the countenances of some gentlemen present while Mr. Nesbit was explaining the system of cutting clover twice and relying on the decay of the clover roots for manure for a wheat crop; but he had himself said, in the presence of four or five persons whom he met this morning, and without knowing any opinion of Mr. Nesbit, nearly word for word what they had just heard on that subject. He had found that in other parts of the country clover was the crop that preceded wheat; and any one who would take the trouble to examine carefully when he ploughed up clover, would perceive that the abundance and size of the roots were likely, when in process of decay, to afford to the wheat crop a large quantity of valuable manure. The only question was, whether the moisture of their climate might not prevent the roots of clover from producing the same effect that they produced in other parts of the country. (Hear, hear.) Of that he could form no opinion.

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Mr. R. Wise was desirous of putting to Mr. Nesbit a question having reference to his remarks on the subject of clover. In that neighborhood it was the practice to eat down clover; and there was, he believed, a clause in all the leases prohibiting the cutting of clover twice in succession. He would be glad to hear from Mr. Nesbit whether or not his remarks were applicable to the laying down clover for two years.

Mr. Nesbit said he knew that was a question which admitted of a great deal of argument. He was aware of the practice of laying down clover for two years. But they lived in two enlightened times

to follow the practice of their ancestors, merely because it was their practice; circumstances might have arisen which required that they should deviate from it. For example, their ancestors did not use artificial manures to stimulate the growth of their crops; and hence, in their wisdom, they laid down the ground for a certain number of years, in order that vegetable matter might accumulate there. It was in this way that he accounted for the prevalence in that county of the practice of laying down seeds for two or three years. He thought it would be worth while to ascertain by experiment whether one year would not suffice; whether, by means of a sort of modification of the four-course rotation, they might, in four years, obtain a better return than they had done under the present system. (Hear, hear.)

The Rev. E. Phillpotts observed that the agriculturists of that neighborhood were in the habit of seeding out, not only with clover, but also with some of the other grasses. He would be glad to know whether or not that practice interfered with the application of the principle laid down by the lecturer.

Mr. Nesbit said, the grasses generally did not enter so largely into the question as clover. He had been speaking more particularly of clover. The grasses were not of the same race as clover; and, not having so large an amount of roots, did not follow exactly the same rule. When they were laying down a regular pasture, of which clover would form only a small portion, the principle which he had laid down was not applicable to quite the same extent, that it would not answer to feed with clover unless they were laying down the land for a great number of years, and even then it would be better to let the clover grow for a certain time than to let it all be fed off as it was produced. They could keep a much larger quantity of animals by that means, than by allowing the stock unlimited access to the pasture.

The Chairman said, a gentleman had remarked that he thought the leases in that neighborhood contained a clause which prohibited the cutting of clover twice. The gentleman was quite right; such a clause was always inserted, and it was important to bear that in mind in discussing this question.

The Rev. Mr. May thought it might, in some cases, be desirable to feed sheep on half the crop, and to cut and plough in the other half.

Mr. Nesbit said, what he had been advocating was, the allowing the clover to be fully developed before it was either fed off or cut. To cut it completely, and then allow it to develop again, would certainly be preferable to continuous feeding; but by ploughing in both the top and the bottom growth they would of course obtain the greatest result in the after-crop. The best course to be pursued depended to a great extent on the amount of vegetable matter in the soil. The plan of letting clover acquire very large roots might not always answer on some peculiar descriptions of light land, a certain mechanical compressed condition of the soil being required in exceptional cases. He knew that Mr. Hudson, of Castleacre, found that it would not do for him, in certain cases, to cut clover twice, because his land was too light.

Mr. R. Wise said, he had dressed some clover, just after the barley was cut, so that it was protected all through the winter. He grew two tons of hay per acre on very poor land. He laid it down for permanent grasses, and he found it answer very well.

The Chairman: There was a top manure afterwards?

Mr. Wise: Yes.

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Dr. Pethick said there were two or three questions which he would take the liberty of putting to the lecturer. The first question was, whether, in the application of bone-dust as a manure, it was not better that it should be applied on the surface, and harrowed in, so as to secure the free access of air to favor the decomposition of it, instead of being, according to the prevailing method, turned entirely under the furrow? Secondly, he wished to know whether ammonia existed at all as ammonia? his opinion being that the ammonia which was evolved in the decomposition of organic substances was generated at the time that decomposition was going on; the nitrogen and hydrogen in the act of flying off having a strong affinity for each other, and then chemically combining and forming ammonia. Ammonia being nothing more than a com-

pound gas formed of nitrogen and dydrogen, was it requisite that they should apply to the soil artificially that which was so abundantly supplied by nature? Had not plants the means of obtaining from the atmosphere all the nitrogen, and from the water in the soil, all the hydrogen, essential to their development and perfection? Again, the lecturer stated that land was less injured by a double cropping of clover than by being frequently eaten by sheep and cattle; since, with the growth of the plant above the soil, there was a corresponding increase of roots beneath, which roots afforded a large supply of manure for the succeeding crop. Was not the effect of carrying off a large amount of alkalies and phosphates in the two crops of clover more than any equivalent afforded by the accumulation of roots? and was the carbonaceous matter produced by the roots at all required by the wheat grown after the clover, seeing that, according to the lecturer's statement, the atmosphere would afford in the form of carbonic gas all the carbon the plant would require?

Mr. Nesbit said, the first question was whether it was not desirable that bone-dust, when applied as a manure, should be applied on the surface, and not ploughed in too deeply. His reply was, that it would be the best not to plough in the bones too deeply, because they would not in clay soils of this district decompose quickly; but with decomposed manures the question might be different. The more the bones are exposed to atmospheric action the better, and that was the reason why it should be finely powdered as possible. The second question was, whether ammonia existed at all as ammonia in farm-yard manure? Ammonia certainly did not exist as such in a piece of straw; but as soon as the straw began to decompose, ammonia was produced, a portion of the nitrogen and hydrogen of the straw or other decomposing matter uniting together to form ammonia, while the carbon and a portion of the hydrogen united with the oxygen, producing water and carbonic acid gas.

Dr. Pethick: In the act of evolution?

Mr. Nesbit: Yes; and if the decomposing and oxydising action of the oxygen went sufficiently far, the ultimate result would be nitric acid, eventually produced from the nitrogen of the vegetable matter. Then with regard to the last question, he must remark that he spoke from practice, and not from theory alone, in what he said about clover crops. With respect to the question of whether plants could obtain from the air all their nitrogen, there was no doubt that some plants could obtain all they wanted from the air, but that others could not, at least in the quantities essential to produce the abnormal crop required by the farmer to pay his rent and taxes. As to the supposed abstraction of the phosphates by the clover from the soil, it must be recollected that what was in the hay was brought back again as manure, and therefore there could not, under proper management, be any robbing of the farm. Had he been speaking of the exportation of farm-yard produce the objection would be applicable; as it was, it fell, he conceived, to the ground.

Mr. Geake would be glad to know whether the Professor could recommend any simple test by means of which the farmer could ascertain for himself the purity or impurity of manures?

Mr. Nesbit thought it perfectly impossible to do so. The great point for the farmer was to take care that he dealt only with those dealers who had something to lose, that was to say, a character. (Hear, hear.) He could give them no other test than that. If they wished to go further, they must either learn chemistry themselves, or they must entrust to others the task of analyzing for them.

M. Huxham wished to enquire of Mr. Nesbit whether salt would be a good addition to manure, and whether it were not desirable for farmers to have their soils analyzed before applying artificial manures to them. With regard to the breaking up of clover for wheat, a friend of his had told him that he had tried the experiment, and the result was that for some time the thing answered well, but that after a time the clover died away.

Mr. Nesbit said he believed the application of salt to be very useful in increasing the strength of the straw and the delicacy of the grain. There could be no doubt that salt ought to be used for grain crops. Even so near the sea as Launceston was situated, the application of three or four cwt. of salt per acre for

grain crops must prove beneficial, and there should be a smaller quantity for mangold-wurtzel and other root crops. As to the analysis of soils previous to the application of manures, no doubt it would be well to know the nature of the soils in different parts of the kingdom, but at present he thought it was more desirable for them to consider what crops they should grow than the nature of the soil. The analyzation of soils often reminded him of the man who, having a house to sell, came with a brick in his pocket as a sample of the house. (Laughter.) They had to consider what drains there were in the soil, and what was their direction, what subsoiling there had been, and so on. There might be almost fifty kinds of soil in the same field. The question, what was the nature of the soil of any particular farm? was, in fact, a complicated question; and, with one exception, he thought the farmers of the present district had better confine their attention to the crops which they had to grow. The exception to which he referred had reference to lime. It was very easy to ascertain whether there was sufficient lime in the soil; if there were not, lime should be supplied; if there were, it would not be of the slightest use to add more.

A Gentleman said, that as it was now generally understood that plants derived their nourishment partly from the soil and partly from the air, he had often been puzzled at finding that the mangold with a small top was generally the largest.

Mr. Nesbit observed that that fact was very easily explained; there was such a thing as over-manuring. This would produce a large amount of foliage and a great development of the cellular tissue of the plant; and if the season should not be favorable, the plant would not fill up the cells with the proper amount of starch, sugar, or other similar materials. The large amount of foliage would have produced a large root had the circumstances been such as the plant required.

Mr. Huxham wished to repeat that a friend of his who sat near him, stated that some wheat which he sowed after clover, in a light soil, did exceeding well for a time, but that the benefit afterwards died away, and eventually the crop was not half so good as it had been.

Mr. Nesbit said it was impossible for him to state exactly what was the cause of that. It might be the wireworm, or some Cornish insect with which he was not acquainted. He could not undertake to give a receipt for every evil in the soil. (Hear, hear.)

The Chairman said, the time having come for terminating the discussion, he wished to make one or two observations before they separated. With regard to clover—in the management of which he took very great interest—he confessed he still entertained some doubts whether what Mr. Nesbit recommended should answer in the West of England, on account of the moisture of the climate, which was better adapted for grass than for grain; and whether, in fact, the clover-root manure might not make more straw than grain. The experiment has never been fairly tried in the district. It must be borne in mind that in that part of the country clover was what he might call the last crop. Wheat, barley, turnips, and barley, had been taken from the land before they put into it clover. To make the experiment fully, he thought nothing but clover should be sown with the barley, and then some lime, or other manure, should be given to the land. The lime acting on the roots of the clover, would contribute to the kerning or forming of the grain, and in that way, perhaps, counteract the tendency of the land to produce straw rather than grain. At all events he hoped the experiment would be fairly tried. There was another point which occurred to him. The lecturer recommended that in forming a dung-heap, the dung should be laid several feet thick, and that it should be covered with earth, which he said was the best deodorizer they could possibly have. That is, no doubt, true; but then another question naturally arose, whether there is any occasion for a dung-heap at all. This question might startle the farmer, who prided himself on his dung-heap; but still he repeated, it was worth while to consider whether it would not be better, after all, to cast the dung direct to the land, and thus prevent any escape of what in the discussion they had heard so much about, viz: ammonia. Now, he was sure that all present were very much gratified by the lecture which they had heard that evening; and he hoped that the Launceston Agricultural

Society would be enabled to secure the attendance of Mr. Nesbit on some future occasion, when additional information would, no doubt, be imparted. Such lectures as that to which they had just listened was, at all events, adapted to set agriculturists thinking. And he hoped that many of those present would ponder what they had heard, make experiments, as far as practicable, in connexion with his suggestions, and communicate the results to the Society. In conclusion, he would, on behalf of the audience, thank Mr. Nesbit for his lecture, and express a hope that that was not the last time they would see him amongst them. (Cheers.)

The meeting then separated.

From the British Farmers' Magazine.

The Supplies of Mutton.

Although beef furnishes the standing dish at our Christmas dinners, yet the prize Southdowns that were exhibited at the great Smithfield market, suggest the expediency of a few facts respecting the condition of our mutton. Leaving out of consideration at the present period of the year the fleece, we will confine ourselves exclusively to the carcase. It is remarkable how uniform is the supply of sheep shown at the Smithfield Christmas market. The average of the past seven years has been 23,724 head, and the past two years were nearly equal—22,870. Of about 4,000,000 sheep required annually for the metropolitan supply, more than one-half would seem to be sent up to market slaughtered.

It is not a little remarkable, that while the sale of cattle at Smithfield market has steadily increased from 184,524 head in 1844 to 263,008 head in 1854, that of sheep has remained almost stationary. In 1844, 1,609,130 head were sold, in 1854 but 1,539,380. Indeed if we refer back a quarter of a century, we shall find that nearly as many sheep were sold at Smithfield in 1829 as in 1854. Mr. Dodd, in his recent work on the "Food Supply of London," attributes this to an increased supply of country-killed mutton, while the increased supply of beef is in the form of live cattle imported from abroad, and mainly sold at Smithfield. Twenty years ago the sheep were eightfold the number of cattle; now they are less than sevenfold.

Scotland had this year, by the agricultural returns, nearly six million sheep (5,822,478.) In Ireland, there were in 1855, 3,598,471, the number then having increased nearly 1,500,000 in four years. England and Wales have probably about 28,500,000 sheep, which would bring the total number in the United Kingdom up to 38,000,000; but we may safely take the whole number at 40,000,000. Average these at 30s. per head, we have an aggregate value of £60,000,000 for the sheep stock of the British Isles. Assuming one-fourth of these to be slaughtered annually, and the average weight to be 80 lbs., we have 800,000,000 lbs. of mutton supplied to our population annually, worth at the set price about £20,000,000 sterling.

Large quantities of sheep and lambs reach Liverpool from Ireland, the numbers being about 200,000 head per annum, and nearly all these are slaughtered for the consumption of that town; in the Newcastle market the number slaughtered is about 300,000. About 6,000,000 head of sheep are now transported annually from their pasture grounds to the large markets for town consumption. We only commenced to import sheep in July, 1842, upon the repeal of the prohibition, when 650 head came in; but the numbers received from the Continent, it will be seen from the following figures, averages about 200,000 head; although the imports of sheep are on the decline, while those of cattle are increasing.

The imports in the last six years were—in

	Sheep and Lambs.
1850 - - - -	143,498
1851 - - - -	201,859
1852 - - - -	330,476
1853 - - - -	259,420
1854 - - - -	183,436
1855 - - - -	162,642

Our neighbor France had, in 1840, 32,151,431 sheep, and killed of these in the year 5,804,700 head; but while the number has not very greatly increased, standing at about 36,000,000, the proportion slaughtered annually appears to have risen to about 8,000,000. In France, however, sheep husbandry is directed more to the production of wool than flesh; hence the return of meat is scarcely half that of our well-fed sheep. If France feeds less sheep than we do, she pastures more cattle. The agriculturalists of France have, however, wisely come to the determination that their breed of sheep would be much improved for food by a cross with the English races; and their breeders and graziers have been large purchasers of stock for breeding. During the nineteenth century France has made rapid strides in wool production, and there is little doubt that breeders will now combine the two requisites of flesh and fleece.

Owing to the increase of population in the Australian settlements, the demand for meats, necessitates more attention to the flesh as well as to the wool. The recent discovery of several million acres of very fine pasturage in Northern Australia, near the Clarence River, by Mr. Gregory and his exploring party, will have a very beneficial effect, in increasing sheep stock and extending the production of

wool, especially to the owners of sheep at Moreton Bay.

The Americans are not fond of fat mutton; a carcase of 50 to 60 pounds is just fat enough to suit the American taste. Of the varieties of domestic animals, the flesh of sheep is that least used in the States, except in a few cities, in proportion to the quantity that might be profitably provided. And yet mutton is perhaps the best kind of meat that can be consumed by a civilized people. New York is beginning to consume large quantities of mutton, 600,000 to 700,000 head, or about one sheep per annum to each of the population, being now the ratio of consumption. Philadelphia slaughters about 100,000 head. In Ohio four or five million sheep are now owned.

Considerable attention is now paid to the rearing of sheep in the United States. The merino crossed with the common breeds is the stock of which the flocks are composed.* The high price of wool and mutton has given increased impetus to sheep husbandry in the States; and they have even begun to export sheep and wool to a small extent.

From the Plow, the Loom, and the Anvil.

Butter Making.

[Our attention has recently been called to a very valuable and eminently practical Prize Essay, read before the Royal Agricultural Society of England. We published several articles on this subject, in our last volume, and are happy to find our own views confirmed by the very careful and scientific experiments, the results of which are given in the report described. We beg leave to invite the attention of our farmers to the following portion of this subject, being all that relates to their particular business. The experiments were conducted by Professor Traill and the late Dr. Bullock. Their accuracy was subsequently tested by the writer of this essay, and his results, with one exception, "agreed remarkably with those made by the gentlemen named."]

One series consisted of the comparative quantity of butter yielded by the following:

1. Sweet cream churned alone.
2. Sweet milk and its cream churned together.
3. Sour cream churned alone.
4. Sour milk and its cream churned together.
5. Scalded or Devonshire cream churned alone.

On the 24th of May, the milk of four cows was drawn in the same vessel, passed through a strainer, and then divided into five portions of six English pints each, which were placed in similar basins of earthenware, in a place, the temperature of which ranged from 55 to 60 degrees Fahr.

Monday, 25th.—The temperature of the air was very hot, 76 degrees; but that of the milk-house, by constant evaporation of water, was kept about sixty degrees.

Tuesday, 26th.—Thirty-nine hours after the milk had been drawn from the cows, it was removed from below the cream of No. 1 and No. 3, by a syphon; the cream from No. 1, and the milk and cream from No. 2, were immediately churned in glass vessels.

No. 1.—Sweet cream churned alone. From previous trials, it was found that the addition of cold water to thick cream facilitated the separation of the butter; half a pint of water was added to the cream; the temperature of the mixture at the commencement of the churning was 62 degrees. In fifteen minutes butter appeared in grains; the churning was continued for twelve minutes longer, or twenty-seven minutes in all, when the temperature was found at 70 degrees. The butter was collected, but from the warmth of the weather was very soft. It was put into cold water until the next day, when it was worked and washed in the usual way, and weighed 1386 grains. It was of a good color, and perfectly well flavored.

No. 2.—Sweet milk and its cream churned together. The mixture of sweet milk and cream was churned at the same time; though cold water was added, after one and a half hour's churning no butter was seen. The churning was continued three hours without obtaining butter.

No. 3.—Sour cream churned alone. On Thursday, the 28th May, the cream of No. 3, which had been separated on Tuesday, and placed in the milk-house, was now slightly acid, and was churned after half a pint of cold water had been added to it. In twelve minutes butter appeared; and in eight minutes more united into one mass. During the churning the temperature of the cream had risen from 54 to 63 degrees. The butter was well washed and worked, and weighed 1756.5 grains. The color and taste were good.

No. 4.—Sour milk and its cream churned together. On the same day, 28th May, the milk and cream churned together, and half a pint of cold water was added. It was fully fifty-seven minutes before any butter appeared, and before the churning appeared to be completed one hour and fifty minutes had elapsed; showing clearly that more time is required to churn milk and cream together, than to obtain the butter from cream alone. The butter was diffused in small grains, and when washed and worked as long as any color was communicated to the water, it weighed 1968 grains. Color paler than the last, but of good flavor.

No. 5.—Clouted cream churned alone. On Tuesday, the 26th, the milk and cream of No.

*Which shows that the writer does not know all about sheep in the United States.—Ed. So. Pl.

), were placed in a vessel of warm water until he temperature of the milk rose to 156 degrees, a Devonshire dairy-maid assisted in the peration. The milk was drawn from below he cream by a syphon, the latter being kept ool until the following day, when it was hurned.

It was ascertained that by churning the milk f Nos. 1 and 3, a few more grains of butter ould be obtained on some occasions, but on no ccasion from No. 5, so completely does the calding process separate the butyraceous matter from the milk. The butter of No. 5, when vell worked and washed, weighed 1998 grains. t had a rich yellow color, and tasted agreebly.

Similar experiments were repeated, the result of which was, that the largest amount of utter was produced by the Devonshire method; he next in quantity, by churning the milk and ream together by a little acescent; the third n quantity, was afforded by cream kept till t was slightly sour. The smallest quantity vas obtained from sweet cream; but on no ocasion was butter obtained by churning sweet nilk alone.

In order to decide on the keeping qualities of he butter obtained by the four processes previusly detailed, samples were exposed to the ree action of the atmosphere.

No. 1 was always found to remain longer vithout any rancid taste than the other kinds.

Nos. 3 and 4 were nearly on an equality—if ny difference, it was in favor of No. 3.

No. 5 became rancid more quickly than No. and No. 4.

When salted for keeping, rancidity appeared n about the same order, commencing in No. , or the butter from scalded cream; next in No. 4, from some milk and cream; then in No. , or sour cream; and lastly, in No. 1, obtaind from sweet cream. The rancidity was supposed to arise from varying proportions of casein; and on instituting experiments to ascertain this fact, it was found that casein assisted in preserving its freshness.

In order to ascertain the effects of overhurning, the cream of six pints of milk was eparated by a syphon, and churned in a glass essel. The butter was formed in about half n hour; but the churning was continued for alf an hour longer, when the butter had lost ts fine, yellowish, waxy appearance, and had become pale and soft, while very little liquid emained in the churn. This butter could not e washed or worked until it had remained ome hours in cold water, being so exceedingly oft when taken out of the churn. After washng it was pale, rather soft, and weighed 2566 grains, which was evidently beyond the due quantity, when compared with the other experiments on the same quantity of milk, which gave the following results:

No. 1. The sweet cream overchurned yielded 2566 grains.

No. 3. The acid cream duly churned yielded 2187.5 grains.

No. 4. The acid milk and its cream duly churned yielded 2397.5 grains.

No. 5. The scalded cream duly churned yielded 2671 grains.

The butter of No. 1 tasted insipid, never became firm, and soon turned rancid. It was found to yield a very unusual quantity both of casein and watery fluid, which could only be separated by melting the butter.

It is a common opinion in some districts, that by adding hot water to the churn, more butter is obtained than by using cold water. Experiments made for the express purpose did not show that the weight increased very much, and it was attended with a perceptible deterioration in quality, giving it generally the appearance of overchurning.

The results of the experiments above detailed are:—

1st. That the addition of some cold water, during churning, facilitates the process, or the separation of the butter, especially when the cream is thick and the weather hot.

2d. That cream alone is more easily churned than a mixture of cream and milk.

3d. That the butter produced from sweet cream has the finest flavor when fresh, and appears to remain the longest period without becoming rancid.

4th. That scalded cream, or the Devonshire method, yields the largest quantity of butter; but if intended to be salted, is most liable to acquire a rancid flavor by keeping.

5th. That churning the milk and cream together, after they become slightly acid, is the most economical process for districts where butter-milk cannot be sold; whilst, at the same time, it yields a large amount of excellent butter.

Starting and Shying Horses.

Persons frequently place these failings in the same category; but there is a wide distance between the two, and they are frequently the result of widely different causes. They are both annoying to the rider; and, if carried to a great extent, are often attended with considerable danger to man or horse, or perhaps both—the danger being more or less in accordance with the situations in which both happen to be. For instance, a horse shying in the country matters little; it is, in fact, a mere deviation from the straight line in which he was going; but in London this deviation may possibly bring horse and rider in contact with an omnibus, or one of Picford's vans. Horses on first being brought to London are very apt to shy, but not to start, and for this reason; they meet or

pass many things to which they have not been accustomed; they fear, and consequently avoid close contact with them, by shying out of the way. The human passenger will pass horses, dogs, sheep or cattle, in most cases, without alarm or avoidance—he has seen such from his childhood; but let him or her meet a camel coming, the wayfarer will probably, like the horse, shy away from it. It matters not whether it be an omnibus or a camel, if, from being unaccustomed to meet, either bipeds or quadrupeds feel them as objects of alarm.

I have some lines back remarked that on horses first coming from the country to London they are apt to shy, but not to start. It will be found to be usually the case: the fact is, the shying prevents their starting. Their attention is so occupied by a continuity of objects, at which they shy, that they do not come on any one, as it were, by surprise. If they did, they would start. Starting is usually the result of surprise; shying that of fear.

Now, on the contrary, horses in the country will more frequently start than shy, from there being by far fewer objects to shy from; and, again, their attention not being engaged, a bird flying from a hedge, a wheelbarrow in a ditch, or a man's hat by the side of, or in the road, will frequently cause a start; but this said hat on the London pavement would probably escape their notice, if that notice was occupied by a coming carriage. Even a London horse, who will after a time walk the streets without either shying or starting, would very probably, if ridden upon Rottenrow, start at a dropped handkerchief if it lay in his path. He sees but the one object: it surprises him, and he consequently, probably, starts at it.

I have endeavored to show the causes of starting and shying, also the difference between the two acts. They arise from his seeing objects that surprise or alarm; but there is a far worse cause for some horses doing either, which frequently is from their not seeing them clearly. There are far more horses going about London streets with defective eyes "than is dreampt of in our philosophy."

An acquaintance of mine, with whom I was riding, was mounted on a very clever cob; he both started and shied, two or three times; his master, who was an irritable man, laid an ash stick very severely about the cob's ears, saying, with an oath "I will give you something else to think of than shying;" the poor cob shook his ears at this infliction of severe punishment. Now, I had before this, from seeing him so frequently start and shy from slight causes and from the peculiar motion of his ears had my suspicions. "Stop," said I "allow me to look at your cob's eyes." did so, and figuratively speaking, found him to be in technical phrase, "as blind as a bat." He certainly would not run against a cab, and could find his way into a stable-door: but his sight was so far defective that most things appeared to him probably as what they were not; and, as no man can tell what they did appear, it is little wonder the poor brute started.

I hope this true anecdote will act as a hint to my friends and readers. There are many persons who have slightly defective sight, without being aware of it depend upon it, many horses have very defective eyes, without their owners suspecting anything of the kind. I would recommend to every one who has a horse that shies, if he does so at objects not calculated to cause alarm, to have him examined by a veterinary surgeon; he will then either learn the worst, or if the shying does not proceed from defective vision he may then take measures to cure him of an objectionable habit, with a fair prospect of success.

I have not the smallest doubt but that horses are affected like human beings with sundry variations of vision. I consider the two that are most common are confused and deceptive sight, and short sight. As we can neither ask questions of the animal, nor apply glasses to his eyes to ascertain what kind of defect he labors under, we can only be guided by his acts. Inflammation or weakness of the eye is easily seen, so are cataract specks on the eye, and many other ailments; but a horse may, and frequently has very imperfect vision, without any of these apparent causes. We will suppose that it is with a horse thus situated we have at present to do, and I will, to the best of my ability and experience, state by what symptoms or rather by what acts, we may generally judge of the state of his vision, which to any one but a scientific professional man

nay appear from superficial examination o be perfectly good.

If in going along a road we were met by a led bear with a monkey on his back, or a man seated on a velocipede, we found our horse astonished, and then shying or starting from the approach of either, we need not be surprised at his doing so; but if we merely met a man driving a calf before him, and the horse showed evident symptoms of astonishment and alarm, I should strongly suspect there existed something defective in his sight that occasioned his alarm at the appearance of such a common object. I do not mean we are to come to this conclusion at once by his doing so; but if he continually shied from objects he must often have met with, or, at least, similar ones, the inference I should draw would be that imperfect vision disabled him from seeing what the object was, or that it appeared to him a something that it was not. Such horse may see his way along a road well enough, and quite answer the purpose of a road horse; but ware the man who would ride him at a fence, for then the secret would out.

I have no doubt many of my readers have found a horse or seen one, in technical term, "buck" on coming to a (say) large white stone on the road, without its appearing to have attracted his attention until close upon it. I have no hesitation in giving an opinion that a horse in the habit of doing this is near-sighted. If, on the contrary, he cocked his ears and raised his head on seeing the stone at a distance, I should infer his sight was confused, and that the stone was magnified to his view, or appeared what it was not; but the sudden start on seeing it, as it were, under his feet, clearly shows he had not seen it till close on it—then he starts, often producing an almost electric shock to the rider. I have seen a horse thus start so suddenly and violently, as almost to bring himself on his nose. Depend on it, no horse will do this but under the influence of defective vision.

The attempt to cure a failing the result of an infirmity, must prove abortive, unless we could cure or palliate the original cause of it. The treatment of horses that start or shy from habit only, will probably form the subject of another article.

HARRY HIEOVER, in the London Field.

Willis' Improved Stump Machine.

PATENTED MARCH 6TH, 1855.

Farmers, Mechanics, Road Builders, Speculators, and all progressive men, your attention is called to this Valuable Patent.

My Stump Machine has great power. It has no equal. It is simple in its construction, easily worked, and not liable to get out of repair. Its common weight is about 1500 lbs. It is easily borne from place to place, and it can be loaded in three minutes, and unloaded, set up, and a lusty stump drawn, all within fifteen minutes. Once fastened, it will pull an acre and a half of stumps without changing anchorage. A single yoke of cattle, or one strong horse, is sufficient to work it. With such a team, if necessary, a power of from three to five hundred tons, can be made to bear upon a single stump!

One can work it, though two work it at better advantage. The time required to extract stumps from six inches to four feet in diameter, will vary from two to ten minutes. With this Machine, standing trees may be taken out, large rocks removed from their beds; and it is the best Machine ever invented, not only for pulling stumps, but for moving buildings, and other heavy bodies. All the iron used, is wrought, of peculiar quality, imported, sustaining 57 tons to the inch!

The price of these Machines varies according to weight and size. I will furnish the Machine at my manufactory, together with an individual right to work it, for $200. I reside at Orange, Massachusetts, where I manufacture this article, on a large scale, and hold myself ready to furnish it, or sell rights to use it, in any State or Town in the Union, now unsold, on terms most reasonable.

This patent begins to be appreciated; all who wish to bring so good a thing into use, and thereby make a "pile of money," should come to Orange, see the inventor, see the workings of the Machine with their own eyes, and if not perfectly satisfied respecting its merits, all their expenses shall be cheerfully paid.

WILLIAM W. WILLIS.

Culture of Carrots.

Several queries have lately arisen in relation to this valuable vegetable, by reason of suggestions from those experienced in their culture.

First, what *depth* should the land be plowed for the advantageous culture of the carrot? Second, can the carrot be advantageously

grown several years successively on the same land? As to the first inquiry, we had supposed that deep stirring of the land, say from 9 to 12 inches at least, would be beneficial to the crop of carrots. It had not occurred to think otherwise, until we had heard a *practical man* who has grown as fine crops as we have ever seen, (more than 1200 bushels of 50 pounds each, to the acre,) say, that he used only a single horse in plowing his land for carrots;—and rarely plowed more than 5 or 6 inches deep. We asked him why he plowed this depth? and he said he would not thank any one to plow any deeper than this. In fact, he knew this depth would yield a better crop than if the land was plowed deeper. He then related his experience in this manner.

One season he had engaged his neighbor to come with his oxen to aid in plowing his carrot field. By reason of some delay, only about two thirds of the field was turned, before night came on; and he turned the remainder next morning, with the horse alone, without the oxen. The entire field was manured alike and treated alike, in all other respects; and the part plowed with the horse alone produced larger carrots, and a heavier crop than the other part of the field. Ever since he has used only his horse in preparing land for carrots, and usually plants from *a half to two acres*. He is not a man who boasts of what he does, or who is fond of having his name appear in papers. He is a man who understands very well what he is about—and what he says can be relied on.

As to the second inquiry, I know no definite facts bearing upon it, but have heard opinions very different, from those equally well experienced. Whether there is actually anything peculiar in relation to crops of carrots following each other can only be answered by those who have been observant of facts. If my recollection is right, the cultivators of Worcester county have maintained that they grow abundantly five years or more successively on the same land. In Essex, the opinion prevails, that it is not well to attempt to grow them more than two years in succession. If you or your correspondents can throw light on these inquiries, they will do a good service to the farmers of the community. ***

Remarks.—It is minute, special inquiries, in regard to crops, that lead to beneficial results. Our correspondent is one of the most untiring and critical observers, and has done good service to the cause by this habit. Theory and practice have generally been united. It is certainly unusual to hear one advocate shallow plowing for this crop; the theory, however, may be a correct one,—we cannot, positively, gainsay it. The common practice is against it.

We have cultivated carrots on the same piece of land *four* years in succession, with a gradual increase of crop. Is not this the correct course? Manure highly, with manure as free as possible from all seeds, cultivate thoroughly, so as to utterly exclude all weeds, and then occupy the same land for the carrot crop from year to year. The main cost of the carrot is not incurred in plowing, manuring or seeding, but *in weeding;* this is a slow, tedious and expensive process,—one which the farmer who is accustomed to active habits cannot endure, and which deters thousands from engaging in it.

New England Farmer.

We will add to the foregoing, that we saw rich land which was deeply subsoiled for carrots, and the crop treated in the best manner, that produced, in our mind, a very unprofitable crop. The carrots were from 14 to 22 inches in length, but very thin and weighed very lightly. We also saw the same season, a crop, the ground on which it was planted was *not* subsoiled, and plowed only the usual depth for a root crop, which yielded a much greater amount in weight, though the carrots were scarcely more than half as long. The roots penetrated the hard ground, then spread, and the carrot thickened. The labor of digging also was not more than half as much as the subsoiled crop.—[*Ed. Tel.*

Cultivation of Cucumbers.

"Last spring a friend of mine and myself were planting cucumbers at the same time. I was planting mine, as is usual in gardens, by mixing a small portion of stable manure with the earth, and raising the hill an inch or two above the surface of the ground. Observing it, he jocosely remarked, 'Let me show you how to raise cucumbers.' Never having much luck in raising them, I cheerfully agreed to his proposition. He commenced by making holes in the earth, at the distance intended for the hills, that would hold about a peck—he then filled them with dry leached ashes, covering the ashes with a very small quantity of earth. The seeds were then planted on a level with the surface of the ground. I was willing to see the experiment tried, but had no expectation of anything but a loss of seed, labor and soil. But imagine my astonishment, (notwithstanding a drier season was never known, and almost a universal failure of garden vegetables,) when I beheld vines remarkably thrifty, and as fine a crop of cucumbers as any one could wish to raise, and they continued to bear for an unusually long time. I will not philosophize on the subject—but say to all, try it; and instead of throwing your ashes away, apply it where it will be of use, and you will reap a rich reward".—*Ohio Farmer.*

Millet.

Millet is an excellent substitute for the ordinary meadow hay. It is perfectly adapted to a Northern climate, and succeeds equally well at

the South, where hay is not generally produced. As forage it is equal in nutritious qualities to the best timothy hay, while the land of tolerable fertility is often double that of the best meadows. When cultivated for the grain, from forty to sixty bushels per acre may be easily grown. It should be sown exclusively for the hay, or for the seed. It is too frequently sown with a view to secure both seed and hay from the same crop, and consequently the seed is light and chaffy, and the hay coarse and inferior.

When hay is the object, from sixteen to twenty quarts of seed should be sown upon an acre and harrowed in. It may be sown any time from May to the middle of July. If sown early, it will be ready to cut in August. In order to have sweet, nutritious hay, it should be cut before the seed is ripe and while the straw is green, and cured the same as timothy, or, after being exposed to the sun a few hours, it may be racked into cocks and cured like clover hay. When well cured, cattle and horses pefer it to the best hay, and for working animals it imparts more strength than any rough food.

It is sometimes cultivated for the grain, which for feeding is equal to corn and more valuable than oats, but it should be ground and the meal mixed with the cut hay or straw. Hogs and chickens are also fond of it; but the present demand for it for sowing renders it too valuable to be fed to stock; the demand has long been greater than the supply, and hence the price is high. If farmers would sow it with the exclusive object of raising good seed, it would be made a profitable crop. It has commanded from $1 75 to $2 a bushel during the present season.

When millet is raised with a view to obtain the best crop of grain for seed, regardless of the hay, it is best sown with the drain drill, putting from six to eight quarts of seed upon an acre. On good land, well prepared and sown in this way, the heads are large and well filled, often yielding sixty or seventy bushels per acre.

One advantage in cultivating millet is, it can be sown at any time most convenient for the farmer, from spring to midsummer.—*Valley Farmer.*

Miscroscopic Discoveries of the Nature of Blight in Wheat.

"M. C. Davaine has lately published, in the *Oumptes Rendus*, the result of his researches into the nature of blight in wheat, of which account the following is an abstract:

Wheat is subject to a disease, which, in rainy seasons, is very prevalent in certain districts; it is known under the name of blight. This disease is caused by microscopic animalcules, whose organization is similar to that of the cylindric worms, which live as parasites in the vorticello, and in man. They are helminthes, of the order of nematoides—thread worms.—These wheat worms have the remarkable capability of remaining in a dry and horny state for years, and then regaining life and motion on being moistened, and this process can be repeated eight or ten times. It was long disputed whether they were animals or vegetables. On examining a grain of blighted wheat, it is found to consist of a hard shell, filled with white powder. This powder contains no trace of starch; it consists entirely of microscopic threads, which are dry, stiff worms. When placed in water, these worms exhibit hygroscopic motion for a few moments. When the wheat is new, they soon make other manifold and considerable movements, which are unmistakeable signs of life. When the grain is old, it requires several hours, or sometimes even days, before they resume motion and life. In a single grain of affected wheat, there are generally several thousands of these worms. They have no sexual distinctions; they are the offspring of other forms. Before a blight comes on, there are found from two to twelve larger worms in each kernel which is about to be affected, and the females of these larger worms have been observed to lay eggs. If blighted wheat is sown with sound, the worms, after a few weeks, and when the sound wheat is germinated, are awakened into life by the moisture of the earth, break through the thin shell which has confined them, and follow the dictates of individual enterprise. The great mass die an unfruitful death, but the few reach the germinated wheat, and effect a lodgment in the stalk under the forming leaves. They are carried up by the growth of the plant, and in wet weather by their own exertions.—As they are dried up most of the time, they suffer no considerable change, until they enter into the forming kernels and lay their eggs. The blighted wheat is no more grain than nutgalls are fruit. Its tissue is composed of hypertrophical cells. It is only after the worms have entered this tissue, that their re-productive organs become distinct. Both males and females become much larger, but the females are larger than the males, and lay a multitude of eggs, in which can be seen an embryo,

that soon breaks through the membrane of the egg, and commences its larva life. By the time the sound corn is ripe, the parents are dead; their remains are dried into almost nothing, the egg-shells are absorbed, and the grain is apparently filled with nothing but white powder. This is, as before stated, the dry helminthes.—*Annual of Scientific Discovery*, 1857.

Lampas in Horses—How Cured.

BY R. JENNINGS, V. S., CLEVELAND, OHIO.

Lampas, as it is termed, is a fulness or swelling of the bars, or roof of the mouth, caused by the cutting of the molar teeth. In all colts, lampas will be found. In many, however, little or no inconvenience may be observable; while in others, the great tenderness of the parts involved, causes the animal to refuse his food, submitting to hunger, rather than pain; in consequence of which, he is compelled to submit to an operation as barbarous as it is cruel, which is no less than burning out the bars with a red hot iron, leaving the mouth sore for some time after. This mode of treating lampas, has been practised for years, and is, at the present day, almost the only course pursued in such cases, notwithstanding it is of no practical benefit whatever; but on the contrary, is often very injurious. Still, the owner will generally ridicule the idea of remedying the evil by any other means. It is an established fact, that children, during the period of dentition, are subject to the same disease. While some cut their teeth with little or no pain, others suffer severely.—What father would submit to an operation upon his child? what mother would see her darling babe thus cruelly tortured?—Wo be to the practitioner who would dare to make such a proposition; yet men will submit their favorite steed to such tortures, believing that course to be the only sure means of abating the evil. In this, they are much mistaken. We do not deny that a horse thus dealt with, will not regain his former appetite, but we assert that, had not this operation been performed, he would have resumed his feeding equally soon, by means less painful, and more humane. In the child, the human practitioner seldom does more than lance the gums. This, certainly, is a more rational mode of operating, and my experience teaches me, that my lancing the inflamed parts, the swelling soon subsides, and the horse feeds as usual. For this purpose, a common pocket knife will answer the purpose very well, after which the mouth should be washed with a solution of tincture of myrrh, two ounces to a pint of water; this should be repeated twice a day, for three or four days, during which time give bran mashes, flax seed gruel; and, if to be obtained, new grass would be very desirable. No hay, corn or oats should be given for a week; the teeth, then, will be in condition to masticate such food. By pursuing this course, you save your animal much inconvenience and suffering, without doing him any injury.—*Ohio Farmer.*

The Sheep-Shearing Machine.

Most of our readers have probably heard something in regard to this machine, though it is very likely that the account of it has been received with some incredulity. That the shearing of sheep can be successfully done, by machinery, is an achievement which affords another evidence that this is an inventive age. We saw this machine in operation at the late show of the N. Y. State Agricultural Society. It was used to cut the wool from a dried skin, the skin having been first moistened, so that it could be pressed over a block in such a way as to present a smooth surface. The apparatus is a box, about the size, and something of the shape of a common brick. It is fastened to the arm of the shearer, who works the cutting part by moving a lever with his hand, so as to produce a rapid oscillating motion of the knives. The knives are shielded by guards, similar in principle to those which are used for mowing machines, and although they can be made to cut very close, it is impossible for them to cut the skin. The machine seemed to work more rapidly than shears ordinarily do, and the wool was cut very evenly—the staple never being cut more than once. The inventor stated that he had sheared a sheep in twelve minutes, but he did not tell the weight of the fleece, and we are without any means of accurately comparing this mode with the ordinary way of shearing, as to dispatch. The name of the inventor is P. Lancaster, of Burr-oak, St. Joseph's county, Michigan. The machine is made by Alexander Allen, of Rochester, N. Y. The price is $10.

Boston Cultivator.

Culture of Tobacco.

Some gentlemen, new beginners, have asked us to give some information in regard to the preparation of land for tobacco and the cultivation of the crop. In lieu of a fresh article, which, if we were to prepare it, would be merely a rehash of others that have appeared previously in the Planter, we subjoin copious extracts from two excellent ones that appeared, the one in January 1852, and prepared for the Planter by Messrs. William Garth, and R. W. N. Noland of Ivy Creek, Albemarle, in pursuance of an order made by the Hole and Corner Club of Albemarle, of which other gentlemen were members: the other by a gentleman of Prince Edward, but not THE gentleman who still owes us a good article on the subject, which we hold him bound to write in the penalty of a "sharp stick:"

Preparation of Soil.—The land selected for tobacco should depend somewhat upon the prospective price of the article. If we have reason to suppose it will command a high price, we pitch the crop upon our best lands, and either increase the number of hills, or at any rate, by applying the manure to rich land, increase the weight of the plants. But if we apprehend low prices, we put it on poor land, and find the enrichment of the land no inconsiderable part of the profits of the crop. But of this we will have no more to say hereafter. We like to break up tobacco land early, particularly red land, so as to let it be thoroughly pulverized by the action of the winter's frost. If possible, we would like to do this when the weather is just above freezing point, in order to destroy the insect deposit in the soil, and with the same end in view, to harrow in the cold weather of February. We plough with a three-horse plough followed by a sub-soile coulter. During March, April and May, haul out and scatter the manure intended for the crop—sow one bushel plaster per acre, and plough in with a one or two-horse plough. Such red land as has no sand in it, after the first ploughing, should not be ploughed the second time, except with a coulter or shovel, so as to break it to the proper depth, without turning under the pulverized soil on the surface. For this purpose a coulter is to be preferred. When the land is properly reduced by harrowing, lay off with a shovel plough three feet four inches each way, and throw up a large hill. This hilling should, if possible, be done early, while there is a season in the land, so as to be ready to receive the plant when the time for planting arrives.

This brings us to the end of the subject embraced in our first division, which we beg leave, with an apology for the imperfect manner in which it is gotten up, respectfully to submit.

In our first article upon this subject, we brought the crop up to the process of *hilling*, and this we recommended should be done *early* while there is "*season*" in the land. In a full crop this is often impracticable, and the planter is forced to depend for season upon the rains that fall after hilling. This should not change the shape of the hills. They should still be pointed and only so many cut off in anticipation of a shower as you have plants to fill. If cut off and allowed to stand for any considerable time the hills bake and require freshening up before being planted. Plants stand better in hills freshly cut off. It is a common error to cut off hills too high. An elevation of six inches above the common level is sufficient on ordinary land. Indeed we consider land unfit for tobacco that requires higher hilling. Wet spots, however, occasionally occur in land cropped in tobacco, which rather than leave unoccupied we plant, and do so by giving increased height to the hill. In advocating low hilling and priming, our friend Gilmer says, "it is better to have *lugs* at *bottom* than at *top*," and we agree with him.

Planting with *too much season*, (upon red stiff land particularly,) is fatal to a crop, as clods are thus formed about the roots of the plant that no after cultivation can reduce. A safe rule is never to plant tobacco until the land is sufficiently dry to work with a hoe.

Many persons, (overseers particularly,) err in not allowing plants to attain proper size before setting them. Small plants may be used in *new ground*, but never in old land, except very early in the season, when the beds require *thinning*.

In planting it is only necessary to observe the following precautions: First, to insert the plant a little below the depth at which it grew in the bed—straightening the roots in so doing. Secondly, to press

the soil well about the roots; and thirdly, to avoid bruising the plant either with the stick in pressing, or the fingers in holding it. Then fold the leaves gently to the north, and place a clod or stone on the south side so as to shade the plant from the sun. This clodding is necessary except in long continued rains, when the roots will take hold before the sun kills the bud. A thunder shower is not sufficient to dispense with clodding; on the contrary the hill being heated by the sun, a sudden shower will scald the plant, unless protected, as recommended. The clods should be left on until the roots have taken hold, which is usually in from four to seven days, and then removed in the evening.

If planting be done late, plaster should be applied to the bud as soon as the clods are removed, but if the crop be forward, this operation may be deferred until the first of June. Plaster is indispensable to the tobacco crop—increasing its weight twenty-five per cent. When applied to the bud, a very small quantity is necessary—say from one half to a thimbleful. It is hardly necessary to say that missing hills should be re-planted. This, however, should be done as soon as possible, so as to insure an even crop, and it is better to get a perfect stand upon one land before you commence on another.

The amount and kind of cultivation depend so much upon circumstances, that it is difficult to lay down any general rules for working this crop. It is all important that tobacco land should be kept at all stages of the crop thoroughly *light and clean*. Ordinary seasons, as a first working, we break the land, if free of grass, by striking three licks to the row with a new ground coulter—or if there be much grass, running twice with the coulters and splitting the list with a shovel plough, and then with hilling hoes scrape down the hills, covering up what grass the ploughs have left, and breaking the crust around the plant. In dry weather it is well to draw a little loose dirt about the root.

The next working we give with the shovel ploughs and, breaking the land and covering up the grass, and follow with the hoes, drawing the dirt to the hill, or "hilling up," and if the plant be of sufficient size, "priming off" the lower leaves and putting fresh dirt about the roots. This will suffice for new ground, but old land will require another working, which is given with the *plough* and hoes, if the size of the tobacco admit of it—otherwise with the hoe alone.

The height at which tobacco should be "*primed*" depends upon the variety cultivated. We prime the Ruffle to about six inches. When the plant has attained sufficient size to give the proper number of leaves above the priming, it should be at once *topped*. This is done by breaking out the bud with such care, as not to injure the top leaves, which are very delicate and easily injured by rough handling. Experience soon renders a hand expert at this operation, and it is well to leave it to a few hands who have acquired this experience. Like every other operation in tobacco topping should be done *in time*, as the smaller the bud the slighter the wound inflicted upon the stalk by breaking it.

Early plants on rich land may be topped to *nine* leaves, but we aim to bring the crop generally to *eight*, to which number we top until the 10th August, when we fall one leaf for each week.

About the 10th August it becomes necessary to "worm and sucker" the crop once a week. Suckers should, under no circumstances, be allowed to grow longer than a man's finger, as their growth greatly exhausts the plant. Every planter should wage constant war upon the *tobacco fly*, and to this end we advise the cultivation about the house of the sweet or monthly honeysuckle, of which the fly is very fond. One of our neighbors, from a few bushes, destroyed several thousand flies last season.

As the tobacco plant ripens it thickens up, becomes brittle, (breaking when gently pressed between the finger and thumb,) and loses that peculiar fuzzy appearance it has when green. Experience is required in judging when a plant is ready for the knife. More persons err in cutting too green than in letting the crop stand too long. As a plant is cut it should be inverted over its own stuble and allowed to stand until the sun *timbers* it sufficiently to admit of its being handled without breaking the leaves, then collecting the plants, stack and cover with bushes, &c., so as to protect against sun-burning. It is well to freshen up land on which tobacco is stacked to prevent *codling*. The plants

may either be hauled to the house and hung, or hung in the field, shingled down, and hauled upon the stick. We usually hang about nine plants to the stick, and place the sticks about eight inches apart in the house. We prefer housing the crop at once to scaffolding.

Having allowed the crop to yellow, we apply slow fires at first, and increase the heat gradually until about the third day, when full heat may be applied. The great danger in firing is in applying too much heat at first. We think a better color is given by allowing the fires to go down at night than by keeping them up constantly. The firing should be continued until the stem is thoroughly cured up; and if the crop be allowed to hang in the house until warm weather, must be removed in warm damp weather to prevent mould.

WM. GARTH,
R. W. N. NOLAND.

Ivy Creek, Albemarle, Va.

The land for tobacco, if it be an old lot, and particularly a clover lot, should be broken up close and tolerably deep in autumn. If the subsoil be a clod, wet or tenacious clay, only the surface should be inverted by the ploughs—and a subsoil plough ought to be run in the furrow of the turning plough. But if it be a dry, red clay a few inches may be thrown up by the turning plough without injury. In any case, the land ought to be rough-ploughed about mid-winter, say in January, for the better amelioration of the soil, and still more for the destruction of the cut-worm. I have not often been troubled by this pest except when this ploughing has been omitted. The best time to apply manure is at this ploughing—but if not applied then, let it be put on by all means before the corn crop is planted—and plough it in as fast as it is hauled to the ground. A heavy drag ought to be run over the land just before it is bedded, and the beds thrown up with one-horse ploughs. When ready to plant, send a steady fellow, with a three-foot stick in his hand, walking along the beds and testing his stride occasionally by the stick. Chop in his footprints with hill hoes, clap and plant thus *in the beds*. If the land has been prepared as early as indicated, there will be *season* enough in it to plant any time in May, without a rain, and the plants will live better than when planted just after a rain; and if the weather continue dry after planting, there will be less danger of injury to the tobacco from the formation of hard lumps around the roots. If proper attention has been given to the plant-beds, the plants will be ready by the middle of May. But if it should be necessary to plant in June, or to re-plant much in that month, it is an excellent practice to put a good handful of dry wheat chaff upon the plant as soon as it is stuck. This covering is better than any other I have used, and so far as I know, the credit of *discovering* it is due to an overseer in this neighborhood. The chaff must never be removed; every living plant will grow up through it in a few days, and thus all "missing" hills will be easily recognized in re-planting.

Instead of "ridging down," or "scraping down," it is far better to put a little fresh earth to the plants at the first working. Run three-tooth cultivators twice in the row, and deep as one horse can draw them; and then let every hoe-hand take one bed and work it as in weeding corn. As soon as the tobacco *starts*, or as soon as the grass begins to spring up, or whenever a crust forms on the surface, it will need a second working. I am disposed to think that the growth of the crop depends mainly upon this work. At any rate I have never seen a good crop made that had been slighted at this time; it is now that the plants *take a set*, either running up with a slender stalk and narrow, short leaf; or spreading out, broad and leafy. It ought to be thoroughly stirred now, and this will be done best by running broadfoot coulters close to the plants, two or four times in a row. Follow the coulters with small dagons, throwing the earth to the plants. Then with hoes dig deep in the step, and finish by putting up moderate hills. An old and skilful planter of my acquaintance says that *fire* may be prevented, in a great degree, *by making small hills*. He says facts led him to this belief, and he shows his faith by his works. The explanation is, that a large hill absorbs more water and retains it longer than a small one. It is probable that very deep ploughing is a better preventive. It is chiefly upon light soils underlaid by tenacious clays that the worst fire appears, and deep ploughing is certainly the preventive

in snch lands; but the two may be combined.

After the second working, one or two slight scrapings up will complete the cultivation.

These remarks, Mr. Editor, about the cultivation of tobacco, are based upon either experience or observation, and indicate the mode I intend to practise in future rather than that I have pursued. I have either tested in my own crop or seen in others the value of every part of the process, except the subsoiling.

As to the proper time of cutting tobacco and housing it, or the best mode of curing and ordering it, I shall say nothing. Thsse are matters, in my opinion, which every one must learn for himself by actual experiment. General instructions indeed may be of some service, but would mislead as often as not.

Yours, A PLANTER.

Prince Edward, January, 1853.

Chinese Plants.

With regard to the *Sorgho Sucre*, or Chinese Sugar Cane, the New Orleans papers, published in the midst of the only sugar section of the United States, contains facts that look favorable to its introduction. Thomas Affieek, Esq., of Mississippi, writes that he has closely studied the plant, and watched the results of the various experiments made, from its first introduction into France until this time, and thinks it possible that it may supplant the sugar cane, but thinks the sugar-growing State cannot lose, even if that be the result, as it will yield more sugar there than further north, beside attaining a vastly larger growth. The South will have an additional advantage in its supply of machinery perfectly adapted to the purpose, and its thorough knowledge of sugar-making.

Mr. George W. Kendall of the New Orleans *Picayune*, writes a letter to that paper on the same subject from his plantation near New Braunfels, Texas. He has made partial experiments with its culture, and says that of its properties for the production of sugar, he can as yet say nothing; he only knows that it tastes like the common sugar cane, and is full of juice about the time the first heads ripen. He adds that as a green fodder it beats everything that grows; horses, sheep, and hogs are inordinately fond of it, and so full are the stalks of saccharine matter that they must be both nutritious and nourishing. Mr. Kendall says it stands a drought better than any thing he has, and does not seem to require rain after it is once up.

Prof. Bacon, of Boston, said in a lecture at the Medical College, that the saccharum of the Chinese sugar cane is not cane sugar, but what is well known as grape sugar or glocose—the same kind of sweet substance that is obtained by boiling starch in diluted sulphuric acid.

We presume most of our readers are aware that the sugars from beets, maple trees, corn stalks, and sugar cane appears to be alike, and naturally inclined to granulate in solid hard crystal, while grape sugar is more inclined to remain in a soft mass, without granulating, and is much weaker in saccharum, though rich as a food.

Grape sugar is abundant in fruit of all kinds, but does not crystalize, except imperfectly. The white sugar in raisins, however, is of this kind, as is also that portion of honey which solidifies. The chemical constitution and the practical values of the two sugars are very different. Two ounces of cane sugar, according to the text books, are equal in sweetening power to five ounces of grape sugar.

For the Southern Planter.

BEDFORD COUNTY, April, 1857.

Mr. F. G. Ruffin:

In perusing the first article in the April number (Southern Planter) on "the plan of instruction in the principal and auxiliary departments of the school of agriculture," &c., we felt convinced that the maturity and precision of the writer deserve the cordial approbation of the farming community of this State. Yet we beg leave to offer to your readers a sketch of difference of opinion, which, although at first sight of seeming unimportance, yet attacks the very vitality of all institutions, but especially that of agriculture.

Virginia, the "farming State," as emphatically termed by a great European orator, has need of a not only "nine months preparation" for agricultural purposes, but of a thorough scientific agricultural school. The mere "ability to read the English language, &c., to write a fair hand, to compose upon the occasion an essay in English twenty or more lines in length, correctly spelled and dictated," and the "acquaintance with the theory and notation of arithmetic, with addition, subtraction, multiplication and division, &c., &c.," are far below the "dignity and importance" of that science, which is followed by a majority of our citizens. Even the subsequently calculated extension to two sessions will upon such a basis prove ineffectual. The numerous Academies and Colleges of this State would labor in vain to attract the young student to the literature of Greece and Rome, their halls would soon be deserted (should the above plan succeed) and intrinsic learning exchanged with a one-sided, superficial and unstable acquisition of empiric suggestions. For, although agriculture is at once the mother and offspring of science, yet it is the only social calling that has proportionally least profitted by its progress.

The "dignity of labor"* demands a pedestal, through which it may be dignified, and more than any other profession should that of the farmer act with the motto,

Magnum fac animum habeas spem bonam.

The gradual or guttatim elevation of agriculture can obviously never reach the gigantic advances of her sister sciences, even because this only *observe, analyze,* and *prove* what agriculture assumes as experimental facts, and common honesty and the open avowal of their approval demand that the votary of that science should be fully acquainted with the nature of the principles assumed. The farmer should be versed in the character of those elevators which lead to his position, and we much rather anticipate a good farmer in one well educated with a view to this science, than in one with the knowledge of ploughing, draining &c., and without a scientific preparatory course. And this is natural. While the former has the capacity of *reading* his soil and of applying p. e. the laws of chemistry to raising its productive qualities, has the latter the more qualification of appreciating and following matter of fact improvements (if suited to his locality) and of *knowing* in what others have had the occasion to instruct him.

With these views we are still advocating his collegiate course (of at least two years) as preparatory to an admission to the agricultural school. Our plan of such an institution has been demonstrated in an essay delivered at the District Fair, held at Jackson, Tennessee, and published in the Agricultural Report of the year 1855, (Tennessee.) Since the number of copies printed was necessarily limited, we will with great pleasure (at your demand) either send our copy or transcribe the essay; should you, however, be yourself in possession of the document, you may as you deem fit make proper use of it.

The details of the plan advised by the author of the article in the Southern Planter, are upon the same principles with our own, and we feel it as an additional reward for the labor bestowed upon our essay, that a man so highly endorsed by you entertains thus far like sentiments with ourselves. B. R., M. D.

* Vide: Address of Ex-Gov. Jones, Tennessee, before the Agricultural Society at their Fair, &c. Report. Agricultural Bureau of Tennessee for the year 1855.

For Whip.—One pint of cream, ½ pint of new milk, a wine glass and a half of white wine. Take a lemon and squeeze in part of the juice, and then slice it, and put it into the cream. Sweeten to your taste. Beat it well till the froth is stiff and serve in glasses.

A Good Cake.—One tea cup of sugar, 3 eggs, 6 ounces of butter, 1 pint of milk, 2 cups of raisins, 1 cup of yeast, 3 pints flour, cinnamon and nutmeg. Very nice for lunch or tea.

Wheat Drill. Enquiry about. Lands in Nansemond. Wyandotte Corn.

Messrs. Editors,—Having it in contemplation to purchase a wheat drill for the purpose of seeding my next crop; but first being desirous of ascertaining whether 'tis politic to use a drill for that purpose, can you induce some of the large wheat raisers of this and the adjoining State of North Carolina, to give us their experience in the use of that implement, and if advisable to use, which is the best for distributing guano at the time of drilling the wheat. At our last State Fair, I examined all the implements on exhibition designed for that purpose, and then thought a drill exhibited by a gentleman named Suddith, preferable to all others; but as I failed to procure Mr. S.'s address and he has not deemed his drill worthy of being advertised in the "Planter," or any other agricultural publication which I have seen, I hereby call on him to let us know where he manufactures his drills and the actual performance of the same (in the form of an advertisement,) or let us have the experience of those who have used Suddith's implement.

Permit me here to ask (*en passant*) if 'tis not an unwise policy for manufacturers, &c., &c., to pursue, in not advertising their implements, &c., for sale, frequently being the case, that the net profits in one article alone, which they would not otherwise sell, more often than otherwise would pay for all advertisements for many, many years.

The wheat crop is very promising in this county; an experience of twelve years confirms my opinion, that this is a very desirable section of the State for wheat raising; here the crop is subject to fewer disasters, matures early and therefore generally escapes rust. The lands are light, with a substratum of clay, easily improved, materials for which are accessible and abundant, such as marl, decomposed oyster-shells or Indian shell banks, swamp mud and woods mould; which 'tis only necessary to make a judicious use of, to render the lands very productive. But there are some draw backs to our advancement as an agricultural community; oysters abound in our rivers, rail-wood and lumber in our forests; various public works are in progress, all of which draw off the more valuable and efficient labourers; leav-

ing the superanuated and women and children to cultivate the farms; men of enterprise and capital might go farther and fare worse than to settle amongst us; here lands are cheaper than any portion of the State I have ever been in, possessing as many natural advantages. I have seen much said of late about Wyandotte Corn, which having planted for several years, I will sum up my experience by saying, that I think it about the most productive corn I ever raised and affording a greater amount of fodder than any whatever; this may be a recommendation to those who approve of stripping the blades from corn (I do not.)

I think it invaluable for sowing to make corn hay of, as each grain produces many suckers, which grow from the root and not the side of the parent stalk; can never be a merchantable article, as it is a very light, soft, flintless corn; may be fed to stock, but is doubtless less nutricious than other kinds or corn; should be planted early, as the blades are often green, when caught by frost. Should you deem the foregoing worthy of publication, you can insert it in the Planter; but if not, throw it aside and no offence will be given to

D. H. H.

Nansemond Co., April 10, 1857.

Osage Orange Hedges.

To the Editor of the Southern Planter.

A few more words if you please, and the last, of the Osage Orange Hedge.

Whatever may be the expense of preparation for planting, subsequent cultivation and management in *Missouri*, as practised by the Mess. Sigenors, whom you quote in your April number, I know nothing and shall say nothing. But I *do know* that here in Virginia, a space of 3 or 4 feet (even less) in width, well prepared with plough and harrow, a furrow or trench in the centre, deep enough to receive the plants without doubling up the ends of the main roots, and that furrow made rich enough for a ten barrel crop of corn, will be found fully sufficient for successful planting—that good plants of one year old, set from 8 to 12 inches apart, are the best. Of subsequent culture and pruning, little need be said; good culture and for the two first years, *close pruning*, are indispensable, and not materially expensive or troublesome.

And as to the time necessary *here*, to form a perfect hedge or fence—if any respectable and unprejudiced man will make the experiment faithfully and properly, I will give plants for the purpose, and if the experiment does not succeed in the *half of seven years* will forfeit ten times the value of the plants to him, as compensation for labor and trouble.

Wm. H. Richardson.

April 13, 1857.

Peas and Snaps. Bugs in.

A correspondent wishes to know how to kill bugs in seed peas. The following, clipped from the Germantown Telegraph, contains all we know about it.

To Kill Bugs in Seed Peas.—J. Perkins, of Euclid, Ohio, says:—On the day of sowing, put the peas into a tub, or barrel; pour on hot (not boiling) water, sufficient to immerse them; let them remain about two minutes, or until the bugs are dead; then turn them into a basket, or something that will separate them from the water quickly, and they can be sown without applying anything to dry them. This has been my practice when I have sown peas for a field crop. The degree of heat required can be ascertained by trying a few, before applying the water to the whole.

Bugs may be kept out of Snaps by sowing the seed from a fall crop, planted in August. Stop them up as soon as dry in a glass bottle.

For the Southern Planter.

Land Paying for itself in one Crop.

Mr. Editor.—I have noticed a communication in the March No. of the Planter, (taken from the Dispatch,) stating that some gentleman purchased a piece of land in one of the upper counties for $800, and sold a single crop of tobacco for $1000.

Now, as an offset, I make the following statement: I purchased a tract of land a few years since, in the county of Surry, for $600 cash. Last year, 1856, I sold 1329 bushels of wheat at $1 60, $2110 40
200 bbls. of corn at $3, 600 00

$2710 40

I reserved corn enough for the use of the farm, and 100 bushels of wheat. I used two and three-fourth tons of guano on the wheat, —none on corn. The land, of course, has been improved since I bought it, by marl and peas. The above crop of wheat was made from 80 bushels sown, or 16½ for one.

W. C. Jones.

Surry Co., Va.

Love of Flowers.

Flowers are considered the ornaments of vegetable life, and have in all ages been cultivated by persons of leisure and taste, for the pleasure they yield to the eye and the fancy. While generally healthy and

exhilarating, from being pursued in the open air, floriculture is justly considered to be a fine and harmless recreation, which by leading to tranquil contemplation of natural beauty, and diverting the mind from gross worldly occupations, has a positively moral, and therefore, highly beneficial tendency. It has also the advantage of being open to the pursuit of high and low, rich and poor, the over-worked man of business, and the industrious mechanic. It is confined to no particular degree or situation. It may be followed with equal enjoyment by individuals of both sexes, and as is well known, on every imaginable scale, from that of the single flower-pot, or ornamental border, to the princely greenhouse and the exquisitely varied parterre. We love flowers. We even love the wild flowers of our woods and fields, and their cultivation has afforded us great pleasure. The natural grace, simplicity, and attractive coloring of flowers, have afforded endless themes for moralists and poets, and volumes have been written to show how many associations of feeling, simple and sublime, these beauteous objects are calculated to excite.

As our desire is to improve the taste as well as the understanding, we hope to be excused for pausing a few moments over this agreeable view of flower culture. Few natural objects are more poetical, or more calculated to refine the morals and taste, than flowers. "From the majestic sun-flower, towering above her sisters of the garden, and faithfully turning to welcome the god of day, to the little, humble and well known weed that is said to close its eyes before impending showers, there is scarcely one flower that may not, from its loveliness, its perfume, its natural situation, or its classical association, be considered highly poetical."

As the welcome messenger of spring, the snowdrop claims our first regard; and numberless are the lays in which the beauties of this little modest flower are sung. The snowdrop teaches us a lesson, too, it marks out the progress of time. We cannot behold it without feeling that another spring has come, and immediately our thoughts recur to the events which have occurred since last its fairy bells were expanded. Whether the "cowslip which spangles the green," or the violet, while it pleases by its modest, retiring beauty, possesses the additional charm of the most exquisite of all perfumes, which inhaled with the pure and invigorating breezes of spring, always bring back in remembrance, a lively conception of the delightful season. Thus, in poetical language, the "violet-scented gale," is synonymous with those accumulated and sweetly blended gratifications which we derive from odors, flowers, and balmy breezes; and above all from the contemplation of renovated nature once more bursting forth into beauty and perfection.

An error, not uncommon, in deciding which flowers shall be planted, is to select numbers, merely for their variety or novelty, without reference to what will be their appearance when in bloom, and which generally leads to disappointment. Unless for botanical illustration, make a choice of flowers on two principles—those which will be beautiful when in bloom, although common, and those which will bloom at the particular season required, to ensure a succession of variegated beauty from spring to autumn. The true amateur gardener takes a pride in cultivating and improving even the common wild flowers of our fields, urging them, by careful culture, to the highest state of perfection, as to size and brilliancy of coloring, of which they are susceptible.

C. N. B.

Genesee Farmer.

A Good Market Garden, &c.

In a private letter, enclosing a subscription to the *Genesee Farmer*, our esteemed correspondent, SAMUEL WILLIAMS, of Waterloo, N. Y., gives an account of a visit to a market garden in his vicinity, which we take the liberty of extracting, for the benefit of our readers:

"It was by no means at my suggestion that you get one of our best practical farmers for a customer, as I had not seen him in a year or more. He said he had exchanged the —— occasionally with a neighbor, for the *Genesee Farmer*, but it was a bad plan, as he always wanted a paper at hand for reference, and to study at leisure its weightier matters. True, we have but few such farmers, and 'pity 'tis, 'tis true.'

"I have just been to see an Englishman's market garden, which beats any one I had ever before seen, even my own, except in corn, wurzel, cabbages and Lima

beans; and he would certainly beat me in the Limas, if he could so far overcome his English prejudices, as to plant them. I doubt whether a larger quantity of onions was ever grown on the same space on the earth's surface. Five years ago, his garden was a wet, sandy swale, where the muck had given the drab sand a blueish tint. He began by cutting an open ditch to let off surface water, so as to make the land fit to plant in the spring; heretofore it had not been dry enough to plant before the middle of June; his crops were better, but not large or early. He now runs tile drains 2½ feet deep, and 40 feet apart through the lot; one of them was under his large onion bed. The onions were planted in rows twelve inches apart; the space is only ten inches after the onions are grown. In these rows the onions were from the diameter of a dollar to that of a half dollar, and some smaller; they not only touched each other in the rows, but most of them were turned up edgewise, and still there was not space enough between the onions, throughout a sixty foot row, to place your finger. His tomatoes were earlier and larger than common; so were his potatoes. His bean crop very large; but his corn and cabbages, though excellent, were no better than is grown on good heavy soils.

"To the eye this man's soil was coarser than a prairie soil, and a shade or two higher colored; but it was pulverulent, and rich in that muck or organic matter it had been collecting from the beginning. Mr. FOSTER said his onions had not been manured at all. A sub-soil of calcareous clay here is several feet below the surface; the neighboring knolls of drab sand, being less aluminous than this swale, need much and constantly applied nitrogenous manures to make them anything like as productive. Here in this drained mucky swale, English turnips in part distanced worms and grew well; but all English, as FOSTER is, he had sweet corn growing in drills, as a second crop, after peas and early potatoes. He says his cow prefers corn fodder to pithy turnips, and it yields much more in bulk."—*Genesee Farmer.*

Preserving Fruit by Hermetical Sealing.

We are glad to see that year by year the old practice of making large quantities of preserves in every family, is declining; and that sweetmeats are giving place to a more simple, healthful, and delicious article, namely, fresh fruit preserved in its natural state, by perfectly excluding the air.

Fresh peaches, strawberries, &c., are certainly a greater luxury in mid winter than the same fruit preserved with sugar, while the expense is less, and the amount of skill required no greater.

The self-sealing tin cans, now extensively introduced, are far superior to the old kind, as the housewife can put them up quickly and safely without the aid of a tinner; they are as easily opened as closed, and the same cans will do for successive years. These self-sealing cans are made in different ways. Some are sealed by screwing a cork upon a rubber compress and applying melted bees-wax; others by warming the cover and pressing into a rim of cement, which surrounds the top of the can; others again are sealed with a peculiar kind of soft sodder.

The chief agent in the work of preservation is *heat*. If after the application of heat for a certain time, (by which process the air is expelled,) the article be sealed up hermetically, it will remain unchanged for an indefinite period. We will briefly describe the method of putting up fruit in this manner, as given by several manufacturers:

First, select good fresh fruit or vegetables. Stale and fermented articles can never be preserved. Vegetables decomposing quick, such as green corn, green peas, asparagus, should be preserved within six hours after being picked, particularly in hot weather. Berries always within twenty-four hours. Peaches, quinces, pears, apples, should be pealed, and the seeds removed before preserving.

Vegetables should be partly cooked first. Such as corn, peas, and potatoes, should be boiled a half an hour; asparagus, a quarter hour. To vegetables, add a half a pint of the water they are cooked in to the quart.

Fill the can with ripe fruit, adding, if desired, a little sugar—simply enough to render the fruit palatable, and set in a vessel of water, (warm or cold.) Let the water boil, and continue boiling until the fruit is *well heated through*—say for a half an hour. Direction has been given to simply let the water boil but such direction is defective, as at this time the fruit in the

centre of the vessel will be scarcely warmed. Should the vessel be then sealed, fermentation will take place. The *heat must thoroughly penetrate the contents of the vessel.* As soon as the fruit is sufficiently heated, seal the can and the work is done.

Another was to make a syrup of two pounds of sugar for six pounds of fruit, using half a pint of water for every pound of sugar. Skim the syrup as soon as it boils, and then put in your fruit and let it boil ten minutes. Fill the can, and seal up hot. Some make a syrup of a half a pound of sugar to every pound of fruit—and some use only a quarter of a pound of sugar to a pound of fruit, while some use no sugar at all.

To keep peaches, pare and cut them up. If thrown into cold water, they will retain their firmness and color. Heat them in the cans as above, or boil them ten minutes in a syrup. In this way, strawberries, raspberries, cherries, plums, peaches, &c., &c., may be kept any length of time, in the same condition that they were when sealed up, and with their flavor unchanged. For small fruit, it is best to make a syrup without water, and boil the fruit in it only for a few minutes.

Mr. Doddridge of this city has experimented largely with the use of different kinds of cans, and gives the following instructions:

Peaches, quinces, pears, apples, should be pealed, quartered, and the seeds removed before preserving. They should be placed in a kettle and be brought to a brisk boil, with as little stirring as will prevent them from scorching, to avoid breaking the fruit. *The fruit should be kept boiling while the cans are being filled.* Tomatoes should be boiled and the skins taken off, and then placed in a kettle and brought to a boil, kept so while filling the cans.

Fill the cans quickly from the boiling material in the kettle, and immediately place on the cap, (which should be warm,) fitting it closely to the shoulder of the neck of the can. Blow or wipe the moisture out of the gallery which the heat of the can within a little time will dry off. Then fill the gallery with cement. This takes less time than filling with cold fruit, and heating the can up in boiling water.

Fresh stewed fruits of all kinds may be kept in these vessels. It will only be necessary to stew the fruit as for the table, adding the amount of sugar necessary to make it palatable;—fill up the vessel with the hot fruit and seal at once. All ripe fruits preserved in this way, will be found as fresh in the winter season as when it is taken from the tree and stewed.

How to know that the can is hermetically sealed, and that the contents will keep—The contents as soon as they cool, will slightly shrink, leaving a vacuum, and the top and bottom of the can will become concave, from the pressure of the external air. This shows that sealing is perfect. Set the can in a warm place, and if, after four or five days, the concave condition of the top and botton remain, all is right. But if they swell out, fermentation has commenced.

As soon as this is perceived, open and heat the contents as at first.

These directions apply to every kind of can, the only difference being in the mode of sealing, and for these particular directions accompany the cans.—*Ohio Cultivator.*

Home-Made Bread.

In the "Newspaper" of last week, (which by the way, is an especial favorite in our family,) I saw an article on the subject of *Home-made Bread,* which accords precisely with my own ideas on that very important subject, and I am therefrom prompted to send my own infallible recipe, for the benefit of my sister housewives, readers of the Newspaper.

You must know then, honored sirs, so numerous are the applications for my recipe, I have seriously, several times, before this, considered the expediency of making it generally known through the medium of a newspaper, and thereby save a deal of scribbling. I therefore now ask the honor and favor of its insertion in your excellent journal.

Invaluable Recipe for Making Bread.—In the first place, there are three indispensable requisites for making good bread, viz: Good flour, yeast, and a careful hand. From three quarts of sifted flour, take one half pint of it in a separate vessel, and scald it with boiling water; let the paste cool to blood heat, and then add one egg, one tea-spoonful of sugar, one tablespoonful of salt, one cup of well risen yeast; whip the whole well with a spoon, and

then pour it into the midst of the three quarts of flour; knead it well, with as much warm water as will make it into a moderately stiff dough; let your bread rise till at least twice its size; then, after again kneading a great deal, mould out your loaves or rolls into smooth, regular forms, wet them over with cold water, to prevent cracking, and set them to raise again under a clean cloth, till by touching on one side, they will quiver on the opposite side, then wet again with cold water and bake immediately. If the fermentation has not arrived at this point, the bread will not be sufficiently light—if it is suffered to go beyond this point, the bread will lose its sweetness. A tin kettle with a closely fitting cover, is best to set your bread to raise in, particularly when it is set to raise over night, to be baked for breakfast in the morning. Your bread should be set to raise in a moderately warm place, in winter, and a cool place in summer. I use yeast cakes, as more convenient, more easily kept sweet, and less expensive. I make them thus:—Boil as many hops as I can grasp in one hand, in a quart of water, down to three half pints, then pour it over a cupful of sifted flour, through a seive or cullender; let it get cold; then add a pint of well risen yeast, and as much Indian meal as will make a stiff dough; set it by to raise, and when quite spongy and light, sift your board over with meal, make your cakes thin and lay them on it to dry; turn them frequently while drying. After they are thoroughly dry, hang them in a clean bag in your kitchen, to insure from moisture. Do not dry them in the sun or near a fire, either will destroy their life. I usually put my board of yeast cakes to dry on the highest shelf in the kitchen, after sifting them over with meal, which can be skaken off with the dust, which will unavoidably fall upon them.—*In Dollar Newspaper.*

Valuable Receipts.

We are requested to insert the following recipes by a kind correspondent to whom we are indebted for some seed of the *Martinoe* and vegetable egg.

A friend has handed us the subjoined receipts for publication, with the remark that they will be found satisfactory in every respect by good housewives.

Soda Biscuits.—Take two quarts of flour, one pint of sour milk, two pieces of butter the size of a walnut, two teaspoonfuls of cream-tartar, two teaspoonfuls of soda; mix cream-tartar with the flour, and soda with the milk.

To Pickle Martinoes.—Soak in brine: take them out and drain them; put them in an iron pot and cover with weak vinegar; simmer slowly until they turn dark and are tender enough for a straw to run through them; drain them and put them in a jar with some sliced onions; boil strong vinegar, cloves, allspice, red pepper, and horse radish, and pour it over them boiling hot; tie up closely, and in a few weeks they will be ready for use. Sugar is a great improvement; if used, it must be boiled in the spices.

French Pickles.—Take one peck of green tomatoes, one-fourth peck of onions, one-fourth pound of white mustard seed, one ounce of cloves, one ounce of allspice, one bottle of mixed mustard, two table-spoonfuls of black pepper, one table-spoonful of cayenne pepper, one ounce of celery seed, one pound of brown sugar. Slice the tomatoes and lay them in salt for twelve hours, pour off the brine, slice your onions and put a layer of tomatoes, onions, spices and sugar, in a bell-metal kettle, until the ingredients are all in. Pour on vinegar until the tomatoes are covered, and boil hard for one hour.

Sweet Mango Pickles.—Fill a gallon jar with mangoes and cucumbers, and cover them with strong brine; after letting them stand for several days, pour off the brine and boil it and pour it hot over the pickles; do this every third morning until you have scalded them three times; you are then to mix equal quantities of water and vinegar, and scald them three times as before, keeping them closely covered with cabbage leaves to keep in the steam. The filling for mangoes, cucumbers and peppers: One tea-cup of black pepper, one tea-cup of allspice, half tea-cup of race ginger, one ounce of cloves, one ounce of mace, one pint of black mustard seed, one pint of white mustard seed, two cups of scraped horse radish, two and a half pounds brown sugar. Beat the spices, but not fine; one small cabbage chopped fine; mix all well and fill your mangoes. Take two pounds more sugar and boil with the vinegar; pour it hot over your pickles. If

you have too much dressing, put it in cotton bags and throw it in the pot with your pickles.

From the South Carolina Farmer and Planter.

Sheep Shearing.

From time immemorial in the wool growing Districts, the first of June has been set apart as a holiday, when scenes of unusual mirth and festivity ushered in the first day of the sheep shearing season. At the present time, in many parts of Europe, the first day of June is known as a holiday, as the beginning of the wool harvest, and is celebrated by feasts and dancing. Even in the United States, the Northern portion of these where there is much attention paid to sheep husbandry, the first of June is a day of general jollification. But with us in the Southern States, where the spring is some two months in advance of that of our Northern neighbors, we must begin to shear our flocks of their fleeces, near the first of April,—some do even before that, but there may be some risk in so doing. If we leave our sheep late in the spring, before we begin to shear, we find many that are poor, exhausted and even look sick, which is caused by their thick, heavy fleeces keeping the air away from their skin, and is keeping the system in a fever all the time. Such sheep will lie in the shade, and will rarely be seen feeding through the day, but early in the morning, and late in the evening, they will do so with a voracious appetite, proving that sheep will endure hunger, rather than expose itself to the scorching sun of early spring.

Many judicious planters object to washing sheep, from its tendency to produce colds and catarrhal affections to which sheep are particularly liable, but it cannot well be dispensed with, as the wool is always more saleable, and if carefully done, need not be attended with any injury; warm, settled weather, however, is indispensable to washing with safety to the general health of the sheep.

When the planter has but few sheep, and needs all the wool for home consumption, he can consult his own convenience about washing his sheep; but with a large flock, and the wool for a market, the sheep must be washed; it gives the staple a lively look, and a softer handling, and can be got cleaner if carefully washed on the animal than can possibly be done after it is taken off from him.

To wash your sheep, build a small pen in such a manner that the sheep may be easily caught, close by a running stream; have one man in the pen to catch and *tag* the string, (which is the removal of all the wool near the extremity of the sheath and scrotum of the males, from the udder of the ewes, and from below the dock, the inside of the legs and thighs,) for two to wash. I have seen some so careless as to drag the sheep in the water on their backs, or any way to get them in. Such practice is very wrong, as well as a hard way to handle sheep. The easiest way is to take up the sheep and carry it. By dragging a sheep into the water, the sand and mud gets in the wool where much of it will remain to the great annoyance of the shears when the sheep becomes to be shorn, besides injuring the sale of the wool. The sheep should be caught by a man in the yard, and carried to the edge of the water, and then held on a bench or stool, until the washer is ready to take it. The washer then carries it into the water to a suitable depth to perform the operation; having squeezed the wool sufficiently in the water, he leads the sheep gently to the shore, and then finishes the operation by squeezing the water out of the wool as much as possible. In this way we serve a double purpose; first, if any filth remains in the wool after washing in the water, more can be squeezed out than will naturally drain out; and second, by squeezing the water from the wool, the sheep is relieved of a heavy burden, which otherwise would cause it to tumble down in the mud, sand, or gravel, running off, which is too often the case when let go with the water in the wool. In such cases they need be taken up, carried back and washed over again.

After all are washed, the sheep should be confined in a close pen until they begin to sweat or steam, and then turn into a clean lot covered with pine leaves or straw, kept clean until ready to shear.

Catch your sheep gently as possible, turn it on its back, set yourself down on a low stool, and lay the sheep's head on your left leg, put your arm over across its body, and with the left hand raise its fleece off from the points of the shears as you work, this is the easiest and safest way to handle the sheep.

After the fleece is off, take it and spread it with the outside uppermost on a smooth bench or table, push the wool carefully together to render it more compact, double the sides over to the centre, throw the clear loose locks into the middle, and roll together from each end; this makes a smooth, dense package, which is secured by passing a stout twine one or more times around the sides and ends; this is now ready for market, and all the wool from the extremities or the second quality, should be closely sheared and saved by itself before dismissing the sheep, but not put up with the choice fleeces.

If wounds are made, which is some times the case with unskilful hands, a mixture of tar and greese ought to be applied. After shearing, such horns and hoofs as are likely to be troublesome, should be sawed and pared.

From the improvement in the price and demand for wool, and that of the coarser qualities, the prospect now held out of a steady market for the article, and a still further en-

hancement of prices, we are inclined to think that planters who have suitable grazing grounds for sheep, would consult their own interests by increasing their flocks. No animals pay better for their keeping when the demand for wool is good and the prices fair; and there is, perhaps, none that requires so little attention during the grazing months, or less food during winter. It appears to be the true policy of planters to diversify their products as much as possible, and we are sure that there is none more available than the production of wool, and for the reason we have already assigned. But independent of the value of the wool of the sheep, there is certainly no meat more delicate, more generally relished or nutritious than theirs; and although the price is greatly reduced to what it was in former years, still when the value of the fleece is taken into account, there can be no question as to their being a profitable kind of stock, while the fact of the supply of wool being greatly inadequate to the demand at present, should operate as an inducement to the extension of sheep husbandry. D***.

The Proper Time for Cutting Timothy.

BY JAMES P. KIRTLAND, M. D., OF CLEVELAND, OHIO.

The proper time for cutting Timothy meadows, (herds-grass of New England,) with reference to securing the best qualities of hay, has been a fruitful subject of observation and remark. Little or no attention has been paid to the influence of the time and manner of cutting, over the health, permanency, and productiveness of such meadows. A vague idea prevails, among farmers, that if the mowing be performed before the seed of this species of grass is ripe, it will run out, from a failure to re-seed the ground. Every observing farmer has noticed that, in some instances, extensive tracts of Timothy sward have suddenly died, soon after the removal of the crop of hay, while, in others, the sward continued healthy, and for a series of years produced abundantly of this grass. The rationale of such opposite results, under apparently similar circumstances, had never been explained, so far as my information extends.

My neighbor, Richard McCrary, an intelligent and practical farmer, has recently presented me with the annexed propositions and conclusions, as the result of his experience on this subject. These he illustrated by specimens of the grass, in every condition to which he alludes. It is hoped they will be thoroughly scanned, by persons competent to test their accuracy. If they bear this test, to Mr. McCrary the credit of the discovery of the facts solely belongs; and I have no doubt the community will consider him as having conferred an important benefit.

1. Timothy grass (*Phleum pratense*) is a perennial plant, which renews itself by an annual formation of "bulbs," or, perhaps, more correctly speaking, tubers, in which all the vitality of the plant is concentrated during the winter. These form, in whatever locality the plant is selected, without reference to dryness or moisture.* From these, proceed the stalks which support the leaves and head, and from the same source spread out the numerous fibres, forming the true roots.

2. To insure a perfect development of these tubers, a certain amount of nutrition must be assimilated in the leaves, and returned to the base of the plant, through the stalk.

3. As soon as this process of nutrition is completed, it becomes manifest by the appearance of a state of desiccation, or dryness, always commencing at a point directly above either the first or second joint of the stem, near the crown of the tuber. From this point, the desiccation gradually progresses upwards, and the last portion of the stalk that yields up its freshness is that adjoining the head. Coincident with the beginning of this process is the full development of the seeds, and with its progress they mature. Its earliest appearance is evidence that both the tubers and seeds have received their requisite supplies of nutrition, and that neither the stalk nor the leaves are longer necessary to aid them in completing their maturity. A similar process occurs in the onion, just above the crown of the bulb, indicating the maturity of that organ.

4. If the stalk be cut from the tubers, before this evidence of maturity has appeared, the necessary supplies of nutrition will be arrested, their proper growth will cease, and an effort will be made to repair the injury, by sending out small lateral tubers, from which weak and unhealthy stalks will proceed, at the expense of the original tubers. All will ultimately perish, either by the droughts of autumn or the cold of winter.†

5. The tubers, together with one or two of the lower joints of the stalk, remain fresh and green, during the winter, if left to take their natural course; but if, by any means, this green portion be severed, at any season of the year, the result will be the death of the plant.

* Mr. Lapham, in his valuable article on the "Grasses of Wisconsin," (Transactions of the Wisconsin Agricultural Society, Vol. 3, 1853, page 425,) says: "When growing in very dry places, bulbs are frequently formed on the roots of Timothy grass, as a sort of store-house of moisture, &c., from which to draw supplies of nutriment, for the future growth of the plant." Mr. McCrary supposes it occurs in all localities, and is the nature and habit of the plant. In this, he is probably correct.

† Florists know that if the stalk of the white lily be cut, prematurely, a similar result ensues; and that, by cutting off the stem and leaves of herbaceous peonies, before they are mature, the tubers will be so much impaired as to fail to bloom the next season.

From the foregoing considerations it is concluded,

1. That Timothy grass cannot, under any circumstances, be adapted for pasture; as the close nipping of horses and sheep is fatal to the tubers, which are also extensively destroyed by swine.

2. The proper period for mowing Timothy is at any time after the process of desiccation has commenced on the stalk, as noted in Proposition 3. It is not very essential whether it is performed a week earlier or later, provided it be postponed till that evidence of maturity has become manifest.

3. All attempts at close shaving the sward should be avoided, while using the scythe, and, in gauging mowing-machines, care should be taken to run them so high that they will not cut the Timothy below the second joint above the tuber.—*Pat. Off. Rep.*

Growing Rubber in the United States.

Messrs. Editors.—After a long interval of country life I again open a communication with you, my main object being to present to the American public, through the medium of the Scientific American, the cheering intelligence that the question so long propounded, as to whether there was anything to be found in the wide expanse of our national domain that partook of the nature and characteristics of caoutchouc, or India rubber, may now be safely answered in the affirmative. I have the gratification of being able to state that the article not only exists in our country, but that it is a common product in all of the States south of latitude 39°. I send you a small specimen of the substance, remarking that it is found in this country in a solid form, instead of the fluid or milky condition in which the ordinary rubber is found, consequently being in minute parts, cohesion of those parts can only be effected by the action of heated rollers, such as are used in all India rubber factories.

The specimen I send you is small and rather ragged, from the cause already stated, the cohesion in this case being effected by the action of a hammer with a heated plate of iron. From a very imperfect and unprofessional analysis I am led to believe that the physical properties of this article and the substance imported are identical. Without pretending to absolute accuracy in my results I think the approximation is C.87·2 H.12·8. The flame resembles the imported article as well as the smell and taste.

"Honor to whom honor" is a motto I sometimes find to fail in the application; lest some other person should set himself forth as the discoverer of this American product, I shall invite the attention of such to the announcement I now make, and if any one has preceded me in the field, let the fact be known during the coming six months, or I shall take to myself the credit, if any be due. As I before stated, the growth of this substance is general, and though unlike the other, it can easily be reduced to a suitable shape for export or domestic use. Joseph E. Ware.

[The sample forwarded looks like the real caoutchouc, and exhibits the same elastic properties, but we do not detect any smell. If it differs from common rubber, it is, for aught we see to the contrary, as likely to be better as worse. Will Mr. W. give us further information?—Ed.]—*Scientific American.*

A Superior Washing Fluid.

Messrs. Editors—I send you a receipt for making a superior Washing Fluid, which I have had in use over two years. There is no precipitate if prevented from freezing and properly made. In the following proportions it will not cost over three cents a quart:

Dissolve 1 pound of sal soda in 1 quart of hot water, and add to it 4 quarts of lime water; when this settles pour off the clear. Next dissolve 3 ounces of borax in 1 quart of boiling water, and add it to the 5 quarts of clear water. When cold dissolve in it 2 or 3 ounces of pulverized carbonate ammonia. Put it in bottles, and keep it tightly corked.

This fluid makes strong, thick "suds," makes washing less injurious to the hands, and it cleans the clothes with less rubbing. Use 1-2 pint, or less, to about five gallons of water; put it, with some soap, into the tub of clothes the night before washing-day, or a short time before boiling the clothes. I think this chemical fluid, among the list of washing compounds, will take "the rag off the bush"—and clean it. Trenton.

Trenton, N. J., March, 1857.

[Washing fluid made after the above receipt we have no doubt will be found an excellent article, and we are much obliged to our correspondent for it.

Many who are in the habit of using washing fluids do not appear to be aware of their nature and specific objects. Why should they be used at all in washing? We answer, simply to provide a slight excess of alkali to combine with the grease and dirt on the clothes. They should be sparingly used, at best, and wholly discarded in washing laces and fine linens.

Good soap suds of sufficient strength makes the best washing fluid for fine white textile fabrics. The chloride of soda makes an excellent fluid for whitening linen that has become yellow in color, and as a washing fluid is inferior to none.

The use of strong caustic alkalies impart a yellowish tinge to fine linens and tends to injure them, and therefore should be used (if at all) with much caution.—*Scientific American.*

To Prevent a Horse from Breaking his Bridle.

A subscriber from Mississippi, writes in a P. S., as follows. The information is worth, to any man having a bridle-breaking horse, the price of the Farmer and Planter at least one year.—Editor F. & P.

P. S.—Have you a horse that breaks his bridle? Go to the store, buy a large fiddlestring, tie one end of it to his bit, pass the other up under the head-stall and tie to the other side of the bit. Tie the string from half to three-quarters of an inch shorter than the head-stall, take loose the martingales and hitch him with the reins (strong ones) and let him pull. Thus you see all the strain will be upon the cat-gut, and that cutting down on his naked head soon brings him to terms. I have never yet seen one make the third attempt under this treatment, and rarely a second. Try it.—*Farmer and Planter.*

Farmers, Note This.

In a cloudy morning, it is a matter of importance to the farmer to know whether it will be sunshiny or showery in the afternoon. If the ants have cleared their holes nicely, and piled the dirt up high, it seldom fails to bring a clear day to the farmer. Spider-webs will be very numerous about the tops of the grass and grain some cloudy mornings; and fifty years' observation has shown the writer of this that these little weather-guessers seldom fail in their predictions of a fair day.—*English paper.*

Using Up the Pig.

What crocodiles were in Egypt, what cows are in Bengal, or storks in Holland, pigs are in Ohio, with this trifling difference—their sacredness of character lasts but as long as their mortal coil; and this is abreviated without ceremony, and from the most worldly motive. In life the pig is free, is honored; he ranges the streets, he reposes in thoroughfares, he walks between your horse's legs or your own, he is everywhere respected, but let the thread of his existence be severed, and, shade of Mohammed! what a change! We think of nothing but making the most of him. A million of his kind perish annually at Cincinnati, to augment the vast prosperity of the city.

About thirty years ago, when it contained only one tenth of its existing population, a few bold speculators began the trade. Selecting the hams and sides of the animal, they made pickled pork; of the rest they took small account. Soon, however, the idea occurred to one more cute than his fellows, that the head and the feet—nay, even the spine and the vertebræ—might be turned to account. Trotters and cheeks had their partisans, and these parts looked up in the market. About this time the makers of sausages caught the inspiration; they found those luxuries saleable, and so many pigs were to be slaughtered, that the butchers were willing to do it for nothing, that is to say, for the perquisite of the entrails or offals alone.

The next step was due to the genius of France. A Frenchman established a brush manufactory, and erected a market for the bristles, but his ingenuity was outdone by one of his countrymen, who soon after arrived. This man was determined, it seems, to share the spoil; and thinking nothing else left, collected the fine hair, or wool, washed, boiled, and curled it, and stuffed mattresses with it. But he was mistaken in thinking nothing else left. As but little was done with the lard, they invented machines and squeezed oil out of it; the refuse they threw away. Mistaken men, again! This refuse was the substance for stearine, and made a fortune to the discoverer of that secret.

Lastly came one who could press chemistry into the service of mammon. He saw the blood of countless swine flowing through the valley of Deer Creek, west of the city; it was all that was left of them, but it went to his heart to see it thrown away. He pondered long; and then collecting the stream into reservoirs, made prussiate of potash from the blood! The "pig was used up."—*Ohio Valley Farmer.*

For the Southern Planter.

Tobacco Plant Beds.

To the Editor of the Southern Planter:

The season has too far advanced for the readers of your paper to reap any benefit from the following suggestions in relation to plant beds this year, but I hope that the ideas advanced, proceeding altogether from the writer's experience in the raising of plants, may not fail to exert its influence and benefit to those who may try the experiment the coming season, and continually. The scarcity of wood in this portion of Piedmont Virginia, and the much greater scarcity of plant land, renders it extremely important, that some method be devised—some practice developed, by which tobacco plants may be more easily and more certainly raised, and the exorbitant consumption of wood diminished at the same time.

Upon almost all estates, large or small, there are some good localities and suitable soils for the growing of plants. Wet, post-oak land, (indicating a close, compact soil, it matters not whether rich or poor,) I prefer for plants. Let so much of that character of soil, with a good

South or South-eastern exposure as may be necessary, be burnt, hard enough to destroy all the grass seed which the soil may contain. After the planting is over in the spring or summer, the remainder of plants are with a scythe or hoe, cut down or dug up, and the patch covered over about six inches deep with leaves, wheat straw, or corn stalks,—I think the stalks or straw are preferable, inasmuch as they furnish more nutriment to the soil and allows more atmospheric action upon the soil. The stalks or straw are allowed to remain upon the bed until the time of farming comes round again, when it is burnt upon the bed, which, with the addition of a covering with brush, old wood, or nothing at all, is amply sufficient to secure a bed as clean, and free of all seed, as it was after the first burning. The soil is now in a much better condition to receive the seed than it was at first, and the preparation not half so tedious and vastly better. This practice I have continued consecutively for three years, and am convinced that it is the best if not the only method we have in our power to lessen the amount of wood consumed, and render more certain the raising of tobacco plants.

Yours, very respectfully,

EDWARD T. PAGE.

Buckingham Co., Va.

PRESERVING WILD FOWL.—Remove the intestines carefully, and wipe out the blood with an old soft towel, until the flesh is quite dry; then dust flour over the inside, and scatter two or three drops of creosote upon a piece of blotting paper, and put that in and tie the bird up tight in another piece of similar paper, upon which put a few drops more creosote; then hang up each carcass separate, in a cool, dry place, and it will keep sweet for a long time. Never remove the feathers from a bird you wish to preserve.— *Germantown Telegraph.*

WHEAT AND CORN.—The auditor of Ohio has made his report on the grain statistics of that State for 1856 to the legislature. The number of acres sown with wheat was 1,407,773; bushels gathered, 19,569,320; the average yield 13.81 bushels. The whole number of acres of corn planted was 2,205,282; bushels gathered, 87,782,434; the average yield, 39.71 bushs.

THE SOUTHERN PLANTER.

RICHMOND, VIRGINIA.

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The Eli Thayer Invasion.

CLARKE Co., April 1857.

Mr. Editor.—Having seen several articles in one of the late papers relating to the intended encroachment of the North on the soil of the Old Dominion, I cannot forbear to sound the alarm to my brother Virginians, to arouse them from their slumbers, and implore them to make every effort to repel the invaders. One of the articles alluded to above, stated that there was a Great Northern Emigrant Aid Society projected, with a capital of three or four millions

of dollars, to be invested in lands in Eastern Virginia, to be settled and cultivated entirely by white labour.

And this society is headed by that rank Black Republican, Mr. Thayer, who was formerly actively engaged in the organization of the Kansas Aid Society.

Now, I ask, Mr. Editor, what will be the result if this project is carried into effect? The answer is apparent; in the first place there will be an increase of not less than 16,000 white inhabitants thrown into our midst at once, and with all their northern prejudices, all their abolition principles, and violent oppositon to our Southern institutions, they will be so many firebrands in our midst, contaminating our negroes, by working upon their excitable and ignorant minds; estranging them from their masters, and inducing them by their insiduous devices to abandon their homes and take passage on the underground railroad constructed for them; and in the short space of ten years they will have accomplished their aim in making Virginia a free State.

Virginians may hoot at the idea, but I tell you, sir, that they can and will do it if they are not crushed in the bud. Let them once get themselves fully established, and they will have a strong and hearty co-operation from the Western section of the State, and with their united efforts they will entice the poor negroes from the protection of his master, and the comforts of home, and cast him on the cold world to—die.

But is there no way to stop this invasion of our rights? I think there is. Let Virginians but be true to themselves, and to their dear native State, and they can preserve and protect their dearest rights.

Let every father in the State educate his sons as farmers, instilling into them from their earliest infancy the beauties of agriculture in every branch, teaching them by precept and example to love their native State dearer than all the world beside; and endeavour to discard from their minds all ideas of emigrating either South or West, but remain firm at their post, rising above every difficulty, proving themselves true Virginians by endeavoring to restore the worn out soil of the State that it may bring forth and blossom as the rose.

YOUNG VIRGINIAN.

A correspondent sent us the above last month, and we received it too late for the April number of the Planter. Since then a friend has sent us a copy of the *Herald* and called our special attention to a letter of Mr. Thayer's therein, in which he avows a purpose to colonize different parts of Virginia with companies of Yankees, who are to settle among us on purely business principles, and without any philanthropy in the case. Our correspondents evidently think it a case in which the views of the farmers should be expressed, and one of them, as has been seen, appeals to them through our columns.

The only reluctance we feel to engage in the question proceeds from the principles on which this paper is conducted, which impel it to refrain studiously from anything that may be supposed to have a political aim or bearing.—This matter, it is true, is one which should rise to the dignity of a social, and moral, and economical question, and we shall attempt so to treat it in the brief response we propose to make to the gentlemen who have "called us out."

In the first place, then, we have to say that at present we do not anticipate any particular harm from the proposed colonization of Eli Thayer and company. We think all history and the very principles of every society prove, that even where a country is conquered and overrun by invaders, it gives more impression by the impact than it receives. The principles of the British constitution at this day, and the language and manners of that people prove that the Anglo-Saxon element predominates over the Norman. The Common Law has nearly absorbed the civil law; the Parliament is the legitimate successor of the Wittenagemote; and the feudal system of continental Europe has left but few traces on Great Britain, though it was forced on it by what seemed at the time an iron hand. Its best features, including *primo geniture*, which, *for that country* is the best mode of landed distribution, are the most that remain. Two centuries ago, these same British people of such exclusive individuality themselves began to colonize India; and though they have held sway almost ever since over the most abject people in the world, they have not yet cracked the crust of caste, though they have been incessantly hammering at it. The larger experience of Rome is to the same effect. If we might condense her history into one sentence, we should say, that overrunning all the world she colonized herself to death. How could it be otherwise?

One nation cannot in a day transfuse itself into another; and yet it is only by daily contact of multitudes that great changes are wrought in opinion; and then, how slowly! God never

meant it to be otherwise. For what would have been the state of the world if all its different societies could have been made to assume each various phase its rulers willed.

Consider, in this connection, that the population of the South is about half that of the North; and then say what chance there is for a mere handful of Yankees to subvert our institutions by any moral power they can bring to bear; and how much more likely it is that such a detachment of colonizers would be absorbed into one mass as a herring might be swallowed by a whale.

Nor need we apprehend danger from any overt act of theirs. If they were to attempt anything of that kind they would be immolated at once, ground between the upper and nether millstone of instant retribution. And they know it.

As little have we to fear from secretly instigated rebellion. The alacrity of preparation and the readiness of defence which the alarm of last winter developed must have convinced the negroes and their friends that their "deliverance" lay not in that direction, if any where. Spartacus, at the head of white slaves, many of them their masters' equals in intelligence and education, and some of them trained soldiers captured in battle, failed to obtain success over a race no braver than Southern men, and, for their times and circumstances, not more martial.

The most we apprehend directly from this particular movement is that a few negroes may be seduced from their masters. But this may be easily stopped if the Legislature will only do its duty, and declare kidnapping a negro a felony punishable by death, and provable, in the case of a citizen of a free State, by the testimony of the negro. This perhaps is unconstitutional; but it is self-defence, and self-defence is "the higher law" of the South. It may be thought harsh, and condemned by that class of humane people who have given a premium to crime by the establishment of penitentaries, and the abolition of the whipping post. But we have tried grass so long on our rogues that it has become necessary to throw stones.

Such considerations as these cannot fail to be entertained by our colonizers; upon whom they will exercise a wholesome restraint, and thereby assure us against much of the anticipated annoyance.

We presume that the real purpose of the leaders of this immigration is to make money, and to engage servitors by any means that it is thought may attract them. They have learned by the census that Virginia is far richer than New England taking out Boston, and they have probably heard that it is a pleasanter country to live in; and they have heard that the lands are "dilapidated and abandoned," until they believe it, as too many of our own unthinking people do, though statistics prove the error. They may have even heard, as we have—(from a Maine lumber man, now a resident of Virginia), that here in this county of Chesterfield—deemed, improperly by the way, one of the poorest in the State, and where one cannot ride five miles in any direction without hearing the drumming of the cooper's hammer, that the lumber, much of it the second growth, is better and more abundant than it ever was in the deepest woods of Maine. They certainly have received, or pretend to have received, good accounts from our neighbour Dinwiddie. They may have seen the rich freights of all sorts with which the Chesapeake pays Virginia's annual tribute to the Union. These, we opine, and *res angusta domit* have stimulated them to "colonize Virginia." But hardly would they venture to come as the old crusader's philanthropist,

Banditti saints disturbing distant lands.

For one, therefore, we feel inclined to let them come, be their intents wicked or charitable, and to invite them to eat us up if they *can*.

But they will not find it as easy a matter as they think. It has been tried by some of their countrymen before; and they have failed. The colonizers of Fairfax county, as we lately showed, "have not done very well:" and in Charles City and New Kent the timber getters from New England have not found themselves a match for the persons they have dealt with.

Of Eli Thayer himself we know something. He is a mixture of knavery and folly who has not the least consideration in Boston, where he is well known, and whence on one occasion he was driven by a mob, because of his demonstrations against the authority of the Court at the head of a party of abolitionists from Worcester during the time of the Anthony Burns—Fugitive Slave question. If he is not treated to a coat of tar and feathers on his arrival in

Virginia," *if* he comes, it will be because of that gentlemanly forbearance which distinguishes our people.

Another aspect of this subject is, we confess, more serious; and that is whether or not it is the commencement of immigration from the North to fill up the vacuum created by the exportation of our negroes to the South. On that matter we have some very strong convictions both as to substitution of white for slave labour, and the effect on our social system of such an inundation. But it is not necessary to discuss the first of these questions now, and our columns are probably not a suitable place to say all that we think might be said on the other.

Irish Potatoes---The Fall Crop.

Most people plant their Fall crop of Irish potatoes in May, usually after they have done planting corn; and therein they make a mistake. In a hot climate like ours the vines grow very well in warm weather, but the tubers mature best when it is cool. The best natural climate for the potato is in Ireland, where it is cool and damp, in Nova Scotia and the New England States, where they have a short Summer and an early, cool Fall, and in the mountainous regions of Virginia, where elevation is equivalent, in point of temperature, to latitude. We do not believe a mean potato can be grown on the Blue Ridge. We have raised the *long Johns*—a large potatoe with a flesh-colored skin and a productive kind—in Albemarle to great perfection of size, but of such a strong, *brassy* taste that they were hardly fit to eat; and we have eaten the same variety, raised at the foot of the Blue Ridge. The latter was a rich, mealy, well-flavoured potato, equal to a Mercer from the North.

Let us consult climate, then, when we plant, and come as near the proper latitude as we can by artificial means. Late planting will enable us to do this.

A late neighbor of ours said, that his father, one year, failing to get tobacco plants enough for all his land in August, planted the remaining hills in Irish potatoes; and the product was the best he ever had. A market gardner of Richmond, two years ago, confirmed the statement by his own experience. We then tried to follow the plan, but failed to get our seed and lost the crop. Last year we planted in May to be sure of the seed, but it was after the first drought had set in, which lasted from the 6th day of May to the 3d day of June; and the potatoes either rotted in the ground, perished in the sprout, or died after they came up. We were so fortunate as to obtain another supply of seed, and on the 10th of July planted again. From the 7th of July to the 4th day of August was another period of very severe drought, and most of the potatoes shared the fate of the first planting. But the crop was prodigious. As there were so many missing hills a good deal of guessing was necessary to get at the quantity of land actually growing the potatoes. But measuring the area and the potatoes, and guessing at the vacancies, we found we had made over four hundred bushels per acre of the largest potatoes we ever saw. They were curiosities; a gentleman at our table measured one—a sample of many—and it was nine inches long; several of them weighed a pound and a great many, fourteen ounces.

Their size, and the failure to get a stand, were owing to the mode of preparation, which was this: the land having been previously well ploughed was laid off in rows three feet apart; the furrow they were dropped in was made by the plough going twice in it, up and down; guano, at the rate of four hundred pounds per acre, was scattered in the bottom of the furrow, and on this was laid stable and farm-pen manure indiscriminately, filling the furrow about two-thirds its depth. On this were planted the potatoes, cut into pieces, having two eyes each,—the cut part on the manure—and nine inches apart. They were covered lightly with the plough, returning a portion of the dirt thrown out by its up and down furrows. In the drought which ensued, the manure absorbed the moisture from the superincumbent dirt, and prevented any from coming up from below; and the potatoes perished in consequence. A row treated with guano alone grew off very very well, and produced a good, but not great, crop. This is one of the Norfolk plans.

We would advise a trial of it—only a trial—by other persons, with this precaution: Let them prepare the ground as we did, but not plant until after a rain has saturated it. It will only be necessary to do it soon enough beforehand to ensure that the crop will not be planted too late. We would not wait until August; for a drought and an early frost

might keep the crop back until frost. Ours was slightly injured by that cause, but mainly by the drought: a light frost will do no harm.

We presume all our readers are familiar with the plan of raising potatoes under straw. If the covering is nine or twelve inches thick, fine tubers may be grown in that way on the hard ground, though it will be better to plough and harrow until a good tilth be obtained. But do not plant too early in this way. The premium crop of Irish potatoes, at the late Fair of the Virginia State Agricultural Society, was grown by Francis Staples, Esq., of Henrico. He planted under straw on the 20th of June, and made, on a measured acre, three hundred and ninety bushels of the finest potatoes we ever saw. They were not as large as ours, though of fine size, but they were greatly better, round, smooth, and uncommonly mealy. Ours were not well-flavoured as compared with Mercers, though they were very fair potatoes. Whether this inferiority was due to the variety, or to the mode of growing, we cannot tell until after another year.

The after cultivation in the Norfolk plan is very simple—throw the dirt from them and weed once—throw the dirt to them. without weeding a second time.. This is all: and for a Fall crop that much may not be necessary. It was so dry last Summer that no weeds grew; so we could not tell.

Reader, try this plan on a small scale, if you please. The labour saved in harvesting and handling a crop of large potatoes is worth the labour and value of applying the guano and dung; and the satisfaction of having a nine inch, pound potato, for your guests, is something.

Sheep: washing them, and preparing the Wool for Market.

Wash your sheep before you shear them; else do not wash the wool at all. If you do you will lose by it—take our word for that. The manufacturer who buys the wool samples it, i. e., he assorts it. In tub washed wool the various grades are so mixed up, by the fleece being torn to pieces, that he cannot sample it. The consequence is, that as different parts of the fleece are used for different purposes, he must work up into his fabric a mixture that does not suit: and besides, he cannot sell off what he does not want. So he will not pay as high a price for it. Wash the sheep therefore, or do not wash the wool.

The mode of washing is very simple. Get a hogshead and fill it with water. Let it stand by a brook with a clean gravelly bottom, where there is a hole deep enough for a boy to fish in with a pin hook. Build a small pen close by and drive your sheep into it. Let two hands put the sheep into the hogshead, and wash the wool until you learn when it is clean, which you will in washing ten sheep. Then, with the assistance of two hands more, put the sheep into the water; move him about in it and squeeze the dirty tub water out of the wool; help the animal up the bank and let it go *on a clean sward where there are no galls or roads;* the sheep will certainly make their lair on such spots and soil the fleece again. Use soap with the first four or five sheep: after that the yolk of each fleece will make soap enough to wash its successor. If the sheep need tagging, as they certainly will, tag them before you put them in the water, and see when you take them out if you did it well. If not, do it over again. There are still better modes; but the plan we give will do for beginners.

In preparing the wool for market, get a bag of stout linen, say five or six feet long, by two feet wide—sow up both *ends* and leave one *side* open. Swing this bag to the joists of the barn so as it will just miss the floor, and will bear the weight of a man in it. As each fleece is rolled up, pack it in that bag lengthwise, across its bottom, with the man's weight until it is full; then sew it up strongly, and prepare another bag, or keep the fleeces until you have finished shearing and then pack it in.

Roll the fleece as follows: spread it on a floor, or large smooth table, with the flesh side down. Then "fold in both sides, putting the loose locks into the middle and making the breadth of the folded fleece from 24 to 30 inches, according to its size. Then roll the fleece from the tail towards the neck, tightly and neatly; and when arrived at the neck put a knee upon the fleece and draw out the wool of it, (the neck,) twisting it into the form of a rope with both hands, as far until it will go round the fleece; and then holding the fleece tight at the lower end of the rope thus made, with one hand, remove the knee, and still holding the point of the rope in the other hand, wind the rope tight around the fleece, making it fast un-

der the rope. The fleece, as a bundle, is easily carried about, having the clipped surface outside."

Another plan is merely to twist the neck wool around the middle of the bundle and secure the fleece by two twine strings at each end, tied around it as around a bundle behind a saddle. Either plan shews the shoulder wool which is always the finest part of each fleece.

Having thus prepared and packed the wool, send it to Crenshaw & Co., in this City. No doubt there are other gentlemen here as honest as they are; but they are the only concern that has a wool depot and employs a wool stapler, of whose services the grower gets the benefit.

If the wool has burs in it, you had better not attempt to pick it. You will be sure to injure the fleece, and there is machinery which does that work better than you can.

As each fleece is sheared from the sheep, make a small round hole in its ear, right or left ear according to sex, with a punch or shoemaker's plyers—one hole for each year of the sheep's age. You can then tell sex and age with half the trouble. We have tried the plan for years.

One Hundred Thousand Dollars Proposed to be Given towards the Endowment of Agricultural Schools at the University of Va.

The author of the following letter modestly withholds his name. But he is a man of means, and able as well as willing to make his words good. Any words of ours would fail to express our sense of the magnificence of this offer. It is a worthy seconding of Col. Cocke.

We still hope that this latter gentleman may be enabled to present his proposition in a form which, whilst it may be acceptable to himself, will be unexceptionable to the visitors. And that then agriculture may get all the benefit of the generosity and patriotism which are ready to be heaped upon her.

Certainly no reflecting man who read the synopsis of Agricultural Education in the last Planter can have failed to see how much agriculture needs a system which shall place her at once on the footing of the sciences, and enrol her name among the liberal professions.

CLARK Co., April 7, 1857.

My Dear Sir:—I have read with great pleasure the "Plan of Instruction in the principal and auxiliary departments of the School of Agriculture at the University of Virginia," as detailed in your last valuable Southern Planter.

If the plan can be successfully accomplished, it will raise Virginia to the first standard—elevate her agriculturists scientifically, and the good old State will be made to blossom as the rose.

I think that the present embarrassment of Virginia, and her important and continued appropriations for the completion of her main lines of Railroads, will put it out of her power, if she was so disposed, to make any liberal grants for this noble purpose, at an early day.

Therefore, it devolves upon the bone and sinew of the State, to lend a helping hand to accomplish this highly important plan.

I cannot doubt that a large number of gentlemen farmers would unite in contributing a fund sufficient, at least, for a commencement. Being impressed with this belief, I would propose, with your important and efficient aid, to make one, of twenty gentlemen, to donate $5000, making in the aggregate $100,000.

Should this proposition fail, then I would propose to make one, of one hundred gentlemen, to donate $1000, making a similar sum of $100,000.

Should this fail, I will take the liberty of making one more effort to rouse the farmers of Virginia from their deep sleep, by urging the great importance of the donations, to resuscitate the State, and awake her from her lethargy.

Under this consideration, I now make the third proposition. I will make one, of two hundred gentlemen, to donate $500, making a similar sum of $100,000.

I have brought the third proposition to so low a figure, that I hope you will soon succeed in raising the amount; at all events, it will have the effect of inducing the farmers to think seriously upon the subject, and prepare them for a subscription at our next State Agricultural Fair, —where I hope to meet you, and subscribe to either of the above plans, that may prove successful, and will be prepared to pay in either case.

Little Giants &c.

It is against our rules to permit a maker of implements or machinery to appear in that portion of our columns devoted to reading, as distinguished from advertising matter, for the obvious reason that they might be all filled up with praises of such commodities. But the following communication from Mr. Hedges is an exception to the rule; because he *really* WARRANTS what he sells. He is not only the maker of the Little Giant, but of another thing which we deem still more valuable; and that is a steam boiler for cooking food for cattle. We hope soon to have one of these utensils on trial, and shall report progress on it, as soon as we have tested it, in order, if it comes up to the description, to give our readers an opportunity of supplying themselves with them before the commencement of next winter. We think it is true of the Little Giant that Mr. Hedges warrants that. We know he warrants the Boiler because he told us so not three weeks ago; and he means by the warranty that if the Boiler does not come up to his description he will take it back. This is honest; and we shall try and help every man who comes before the agricultural public with a plausible invention, and shows that he is disposed to act so fairly by them.

Moreover, we liked what we saw of Mr. Hedges; and we thought of him, as we do of our friend "George Watt, the Ploughmaker," as he loves to call himself, that he was a man out of whom any sensible farmer might "make expenses" in an hour's chat.

For the Southern Planter.

MR. EDITOR:—In perusing your valuable paper, my attention was arrested by the article in the March number in which you have noticed the contest between the Little Giant and Young America Corn and Cob Mills. For the complement bestowed upon me for my ingenuity and mechanical skill, I am duly grateful. But there are limits to human efforts. In regard to making cheap mills, strong mills, and at the same time durable ones, some points are involved that can hardly be combined in one and the same mill, although you will find that nearly all who have tried their hand at the cast-iron mill business *claim* for *theirs* all these and many other desirable qualities.

The following points in construction and use of mills we are compelled to observe: 1st. All cheap mills must run slow, as gearing will increase expense and liability to derangement. 2d. The rate of grinding will be in proportion to the space or openings through which the meal has to pass. 3d. The durability will be in proportion to the depth of the grooves, the amount of surface exposed to wear, and more especially, as to the angle at which the grooves or cutting edges cross each other; for if the meal is made to slide by the great angle of grooves, much power will be required, and rapid wear the consequence. In our experience, we have adopted, as the best means of obtaining the desired object, (of economy in feeding stock,) so to construct our mills as to obtain the greatest amount of grinding surface, with as little diameter of mill as possible; by which means we have no trouble in making true and strong mills. We make such depth of groove as to enable us to grind to suit the majority of feeders, and with sufficient speed to enable a farmer to feed an ordinary amount of stock with a few hours' work of grinding. But, as we were well aware, for more than twenty years past, just as soon as the farmer's attention could be fully brought to the system of cooking food for stock, he would surely adopt it; in which case, fine grinding would not be requisite. We have looked to that era with confidence; and I now predict that five years will not elapse before every farmer, who studies the true philosophy of economy, will not only grind but cook his feed for his entire stock. I am aware that many difficulties present themselves to the mind of the feeder, but it matters not, for difficulties to the mind of the Anglo-American are like disease in a strong and vigorous human constitution, which if not *doctored too much*, will work its own relief. The greatest obstacle to agricultural advancement is in the tendency of inventors and mechanics in their incipient efforts in getting out new machines to yield to the pressing demand for very cheap ones, and hence they sometimes get them so cheap as to be worse than valueless, for they not only fail on the hands of the farmer, but deter him thereby from trying a good article from fear of a similar result. Most implements have increased in price owing to the increase of construction. For instance, twenty-five years ago I made threshing machines and sold them for $65. Good machines now cost from $250 to $350. I sold good ploughs for five and six dollars, they now cost from ten to fifteen. We sold corn mills at first at $40. We have sold more at our Cincinnati establishment at $50 the past season than at any less price; and in the interior of Kentucky, they prefer our $60 mill. Farmers, in selecting implements, consider the fact that they are likely to, and in fact, almost sure to increase their business whereby that which will answer for to-day will be insufficient a year hence.

I have therefore adopted the rule of first making the implement to do the business required, and then see what it costs; and then

sell it at a remunerating profit or quit the business.

Respectfully,

J. A. Hedges.

Richmond Cattle Market.

Mr. Shook's Reply to Mr. H. B. Jones.

By request of Mr. Shook, we insert, from the *Whig*, his reply to Mr. Jones' article on the Cattle Market in the last Planter.

We did not know that Mr. Shook was the party referred to by Mr. Jones, or we would have given him notice. We do not feel called on to take part in the controversy, but we would suggest that the great difficulty consists in the fact, which no skill of the agents or salesmen can remedy, that there is not a packing house in the city of Richmond. It is very possible, if there were, that there would still be gluts of cattle; but though they might never bring as high prices as they now do upon an open market, they would not be as low, because the surplus could be worked off by the packers. The dissatisfaction which many now feel, is owing to the extreme prices which a glut and an open market now alternately produce. Each man likes to sell as high as his neighbor, and *will* not understand the cause of the great fluctuations in the Richmond market. If there were more uniformity, even under a lower average, there would be less complaint because there would not be such wide degrees of comparison. We are sure of this, because we were once both grazier and feeder and know the general course of trade in the Richmond cattle market.

We shall make an effort shortly to have a packing house started in Richmond by some of our enterprizing and public-spirited citizens. If they will not do it, and such men as Messrs. Cullingworth & Lindsey will not, then the graziers themselves ought to get up one.

We would like to hear from our friends of the South-west on this matter; and would like to know why an extensive packing establishment might not be got up at Wytheville, or at some point still nearer the Salt Works. If Alexander Mathews, the Cloyds, McGavocks, Kents, Prestons, Sanders, and Crocketts take such a thing in hand, we should not anticipate a failure. They pack both beef and pork by the thousand in Illinois. Why not in the interior of Virginia? Gentlemen, let us hear from you. Call your meeting for the South-west, and have your tierces ready by the time the steam ferry line goes into operation. Why should cattle be driven to Baltimore and Philadelphia, and "drifted" the full value of the fifth quarter, and fed at nearly the same cost, when all this might be saved except a little freight? In Baltimore they import the salt, the tan-bark, the staves, and the cattle. All these, you, gentlemen, have at your own doors. Start the thing for your own credit, and the credit of the State, and relieve the "*glut*," forever. Think of this, and you will see its perfect feasibility. We predicted it for you five years ago, and it is time our prophecy were beginning to be fulfilled.

Mr. Editor:—In the April number of the Southern Planter, a communication relative to the Richmond Cattle Market appeared, whose authorship is claimed by *Mr. Henry B. Jones*, of Rockbridge, and while as a whole its object and tone are valueless,—and by no means calculated to remedy the "evils" he speaks of, still the article is absurdly unjust and rather vindictive, bolstering up himself and his far-fetched ideas, by slanderously assailing a certain *cattle agent* in this city. I feel called upon, after this necessary preface, to let the people know, as well as Mr. Jones, the manner of conducting my business; and presuming due attention to this subject will be paid by your readers, (drovers and graziers especially,) I will commence by replying to his article. He says: "Could the trade of your place be so regulated that the sales of beef cattle would be more uniform, I doubt not many of our fine cattle which are now driven to Baltimore would be disposed of in your market." Let me ask this wise reformer what he means by the word "regulated?" If he means a *continual scarcity* of cattle, which would always keep an *open market* and thereby keep the *price very high and uniform*, then I understand him; but if he means that cattle which he may send here and bring into a crowded market and sometimes ahead of his turn, (I mean when others are ahead of him,) then he may suggest his reform. What though can it be? One thing is very clear, that the *only possible* way of keeping uniform prices is, to keep the market all the time bare of beef. How would this operate? Keeping cattle at home simply to create this reform would be "jumping out of the frying pan into the fire." Cattle in a case like this would eat off their heads at home, instead of near Richmond, where they sometimes have to lay out a few days, *simply on account of a glutted market.* This position of Mr. Jones is so ridiculous as not to merit notice—but let him have the full

benefit of his reform thus far. A kind Providence afflicts some people with too much wisdom, and in this instance we see a melancholy demonstration of the fact.

In the second place he says: "Let them (the graziers and drovers,) call a convention to meet at the next Agricultural Fair at Richmond, where the matter can be discussed and such steps taken as will remedy some of the evils under which we now labor."

Now, can any man of sense read the above extract from his article without coming under the influence of *risible emotion?* This is a free country, and the people have a right peaceably to assemble to redress existing grievances; but what can this proposed convention do towards keeping open markets—towards forcing butchers to give more for beef than it is worth? If Mr. Jones supposes this can be done, he is vastly mistaken. All men, like himself, will sometimes look to self-interest, but all of us have to yield to circumstances at times which are beyond our immediate or effective control. To keep more than one drove of cattle from coming into market at a time could not be done—is it necessary that every man owning cattle should write to every other man in the State that he intends starting his cattle on such a day, and that he must not start, else they will both come into "a tight market," and thereby be "literally skinned." This species of reform can't work, and the convention can't remedy the "evils" of a crowded market. In an open market, our prices here will compare favorably with, and oftentimes exceed, those of any other market, and, let me add, for the last two months cattle have been considerably higher here than in Baltimore. The only thing the convention Mr. Jones proposes can do, is to get up *packing houses* for *his* benefit, which he suggests as having *a tendency* to keep an open market and more uniform prices. *How wonderful!* Baltimore becomes glutted with cattle as often or oftener than our market, notwithstanding the fact that there are three or four packing houses there. Now *suppose* we had packing houses, might we not still be in the fix in which we sometimes now find ourselves? But we want to know what sort of a *reform* the proposed convention can effect? I should judge they would say, take choice of your agent, or sell yourselves, or sell at home. As Mr. Jones *harps* on the Baltimore market, let him continually keep in mind that our prices stand a better average, and that Baltimore is glutted as often as we are, and when in a *glutted* state, drovers are sometimes *skinned* there. One thing is very sure, the convention may meet and debate—have Mr. Jones for orator, and any reform they suggest will go no farther than the *conclave* over which I propose Mr. Jones to preside. As warm weather is coming on, would it not be best for Mr. J. to have *his* convention called in the course of sixty days. Fish, fowls, and "small meats" generally, are coming in freely, and will continue to come in for five or six months, and a large decline in the prices of beef may be expected. So, come on, have your convention, and drive out the fish, fowls, &c. Usurp the throne, and utter your *manifestos.* We may then with propriety ask you, "On what meat doth this our Cæsar feed, that he hath grown so great?"

Now let me give a true statement of the cause, which led Mr. Jones to perpetrate his effusion on the "Richmond Cattle Market." In the month of December, 1856, Mr. Jones wrote me he had a drove of cattle he wished me to sell—wished me to have an open market. I advised him when to start—he did so, and previously to getting near Richmond, other droves which had started before his, and were ahead of him, cut him out of his turn. Mr. Jones came to see me, and insisted that his cattle should come in ahead of others which were ahead of him. To this proposition I could not in justice to my customers or myself, assent. In other words, I distinctly told him it was an unvarying rule with me, that when several droves came to a stand about the same time, the one which *first reached there should come in first.* I considered this fair, and have observed it carefully in the prosecution of my business. Mr. Jones would not, however, take the "miller's turn" of "first come, first served," I, however, appointed the day on which his cattle should come in—they came, the market was so full and prices so low, that I was neither able to get a fair price, nor willing to sell at a reduced price. He then, according to my advice, drove back a short distance from the city, and instead of waiting till I should send for the cattle, the next day brought in thirteen instead of half his cattle, and sold them; and next day sold half of what remained—*he sacrificed his cattle,* and now "bites off his nose to spite his face!" I was very well satisfied with his selling his own cattle, because I never ask any man to send stock to me. He had a portion still left—I had an order for eight cattle from Hampton. Feeling interested in his welfare, I told him I would take nine of his cattle at $7 nett, and send to Hampton. I did so—made the usual charges of commission, &c., and gave him my acceptances at 30 and 60 days. I sold these cattle, as I always have done, on credit, and I have not yet received the money for them, the amount of which is $324 45-100. My first object in selling stock is, to get a fair price, and to effect this object, the credit system must certainly be observed to avoid a sacrifice. Any salesman who sells *for cash* will not do much selling, and those for whom he sells will be "literally skinned," to use Mr. Jones' delicate English. Owing to heavy losses I had previously met in past years, by the unfortunate result of business at the hands of butchers, and

at the same time feeling very sure that $1 per head was too little for selling and guaranteeing sales, I added the "guarantee," which I only kept up for a few months owing to a dissatisfaction it created in the minds of some. The guarantee is abolished, however, and no cause of complaint can exist. If any "evils" are to be remedied, they must be remedied by *Mr. Jones' Convention*. The truth is, Mr. Jones' effusion only results from the fact that he coutd'nt govern me, or make me depart from my usual and approved mode of doing business. He *suffered to the extent of a hundred or two dollars*, and *his pocket* "cries aloud and spares not." He may blame *his extravagant wisdom* for his great and irreparable *loss*. Mr. Jones says he gave me to understand I was done selling cattle for him—I also gave him to understand he need not write me any more letters in regard to selling his cattle after that time. I was very willing and anxious to be rid of him. I will also inform the public, that while I got $3 50 gross for Mr. Jones' few, (I sold,) I disposed of several droves, the same day, at $3 00 to $3 25 gross, say $6 00 and $6 50 nett. In regard to the "respectable opposition" of which he speaks, I will only say, that "opposition is the life of trade," and that I cannot object to it as long as it is respectable; and while I am still in the market, I pledge myself to obtain the *highest market prices* at all times. *The opposition and myself both charge alike.* I have associated with me Ro. H. Crockett, Esq., of Wythe county, and under the style of *Shook & Crockett*, we are prepared to sell at $1 per head all cattle sent us for sale. Our continued endeavors will be to do full, even-handed justice; and before closing, let me advise Mr. Jones to write *another Essay on Catterpillars*. They are "small game," and will suit his capacity to a fraction.

By the way, I would advise him also, to give the public an essay on the "chinch-bug," and "tobacco worm." As he refers to me very cautiously as the "agent," I will give him my mame in full, with best wishes for the success of his convention and its reforming schemes.

JACOB SHOOK,
Of Shook & Crockett.

Richmond, April 13, 1857.

Tethering Work Horses at Grass.

A good many years since, when we lived in the county of King William, where, if we were twins one of us would live again,—either there or in Albemarle—we saw Gen. Aylett's horses and mules staked out on clover, and secured by a very simple contrivance beyond the possibility of escape or danger from the tether. The thing was made in this wise: take two small hickory or white oak poles, seasoned is best, and slightly flatten each end: get two links of an old chain or have two made; have made also two staples in the form of a jewsharp, with two small holes in the jaws thereof; connect them by the links, and then secure them by wrought iron nails to the ends of the poles. Now fix a similar shape to each other end; secure one of these ends to the ground by an iron pin 15 inches long, strap the mule by his neck to the other end and, "let him rip."

Our esteemed friend Mr. Wm. S. Fontaine of the same neighborhood, thus speaks of them, and of a still simpler plan.

I used these tethers for some 5 or 6 years, and never knew any accident to occur. They were discontinued simply because I had grazing lots and pastures enclosed, though I have tethered my mules out at night on the clover field for many years, simply for the convenience of *catching* them in the morning. I, however, with them, use a large rope 12 feet long, fastened to a leather halter, and tied to an iron pin 15 inches long—made thus, q, of half inch round iron. The whole business costs 60 cents, and it will last three seasons. When I do my mules thus, I work one set half a day, stake them out, take up the other set and work the balance of the day. In this manner I never give my mules a grain of corn or a blade of fodder from the 10th or 15th of May till the oats crop comes in. Under this treatment they become very fat and sleek. When you first tether a mule he will wind himself up, but in a few days he becomes perfectly acquainted with the whole machinery, and never ties himself up at all. I was apprehensive that they would cut themselves, but I have had 12 mules tethered out every summer since 1847, and never yet have had one injured in the slightest manner. I had a wild horse somewhat cut by the rope on his hind leg; and with a small rope, particularly, there must be more danger than if the animal were running at large without any tether.

The Hundred Mile Trot.

Two New York horses lately trotted one hundred miles in harness, carrying 300 pounds each, in twelve hours and twenty-two minutes. The stakes were $2,500. They performed well, and were not touched with a whip during the race. One horse, it is said is of "good stock;"

the other, and the victor, is blooded, being by Eclipse (what Eclipse?) out of a Messenger mare. One was stopped and rested awhile, and the other was walked eleven miles.

The Albany *Statesman* says:

This is the greatest race on record, nothing of the kind ever having been attempted before, and the speed shown by the horses surprises everybody. Even in the hundred mile races over a course, the time has not been equalled, and had the same speed been kept up to the end of the journey as was shown to Herkimer, the hundred miles would have been trotted in a little over nine hours.

We think this is a mistake. If we remember correctly, Mr. George Presbury of Louisville, Ky., trotted a mare one hundred miles, from Lexington to Louisville, in a match against time in ten hours; and the time *has* been equalled on the race course. It has been equalled elsewhere. A few years ago a mare in the neighbourhood of Woodville, Albemarle, as we heard shortly afterwards from Mr. Ben Wood of that county, with no training whatever, went under the saddle in a hilly country, upwards of one hundred and twenty miles in a day; and was not much fagged.

In old times when gentlemen travelled from Albemarle to Richmond on horseback, it was a feat that a good many persons accomplished to travel from Charlottesville to Richmond, about 87 miles, in a day, on horses that were not trained. The late Gov. Randolph had a noted horse Dromedary, that he rode several years, and on that horse he never drew bridle between Charlottesville and Richmond; and he was a pacing horse at that. The same horse, or another, was once ridden the same distance by the Governor's man Phil in one night.

Both horses and men under training, or even without it, if inured to fatigue, and of good constitutions, can perform journeys, and make time which would be thought marvellous. Mr. Zachary Lewis, now living near Scottsville, once, when he was in his prime, walked from Richmond to Scottsville—a distance of seventy-five miles—in a day. An Indian at Fort Crawford, after a fortnight's training, ran on the parade ground forty-one miles in two hours! And in a subsequent race, for his life, he outstripped twelve Winnebagoes—he was a Sioux; and the horses, ridden by our officers who were to accompany him to the boundary of his own country, were so thoroughly blown in attempting to follow him that they gave in after a run of four miles.

We wish we had space for the whole of this Indian story, for it is exceedingly interesting.

The Wheat Crop.

A friend who has lately paid a visit from Albemarle to Loudoun writes us:

This country is now looking badly. If you are collecting wheat statistics, I can speak for the crop of Fauquier and Loudoun as being the most unpromising I have ever seen. All the early seeding is destroyed by the fly and hard winter. Many fields show no sign of life at all. My father has a thirty acre field which cannot make thirty pints, and there are others equally unpromising. The wheat in Albemarle is looking better than any I saw between that county and this. I am inclined to think that the Albemarle "dogs" are about "having their day," and that other parts of the State are to pass through the period of bad-luck under which we groaned so long.

Another friend from Amelia writes that his wheat crop is a very good one, and the other crops of that region are fair.

We hear conflicting accounts of the wheat from lower James River. Probably the river farms are promising; the uplands not so good. Late sown wheat, especially, is not apt to be a good crop after such a hard winter and late Spring.

The crops in Augusta is only tolerable.

A gentleman who has recently been over a part of Fauquier, Prince William and Stafford, informs us that he saw but three promising crops of wheat. Other information from neighboring counties is of like import, and unless a very material change takes place the crop will be unusually light on the eastern slopes of the Blue Ridge.—*Fredericksburg (Va.) Herald.*

A New Tow Boat and Lighter Line.

One of the purposes which it was thought would be subserved by the Dock connection was, that a line of lighters capable of entering the basin and discharging and receiving cargoes at the mills would be established. This would save a good deal of expense to the farmers and to the millers who now have to haul to and from Rocketts, and load and unload twice. The lighters might take down the flour directly from the mills, and call at the different landings on their return for wheat.

We are happy to be authorized to announce to the farmers on the lower James that there is a prospect of such a benefit being done them.

Our friend Tompkins, who is at the head of the present tow-boat line, is a very fine fellow, as all his acquaintances know, and a very public spirited and business man. We have no wish to to see competition against him; but if he does not undertake this enterprise himself, he may rely upon it that it will be done by gentlemen who generally make things go if they take hold of them. And it can be now done in time for a portion of the next crop of wheat.

Louisiana *vs.* Virginia.

Our friend, Mr. Pryor of "*The South,*" lately turned over to our hands a paper printed in New Orleans which had indulged in some very disparaging remarks about Virginia. At another time we may attempt to show that no State in the Union is as much underrated as Virginia is, compared with any other in the confederacy. We have no time to do it now; and will merely say that if it were otherwise, it certainly does not lie in the mouth of Louisiana to cast a sleer upon us. She is the only State, North or South, whose main staple comes into serious competition with a similar foreign product—sugar. And she is utterly unable to compete without a high duty on that article, as she constantly proves by loud and incessant clamour for protection. Were our staples as well protected as hers, Virginia could in a few years buy out the whole of Louisiana.

Cleveland Bay Stallion.

We are happy to learn that our friend Dr. Jno. R. Woods of Albemarle is daily expecting a fine three year old Cleveland bay Stallion from England. This is the third of that valuable class of English horses that Virginia will get the benefit of, Mr. Rives' Emperor, and Mr. Dulaney's Premium stallion Scrivington being the other two. We heartily wish Dr. Woods as much success with his colt, should he come up to the description we have of him, as his public spirit deserves. He is already pretty well known as a breeder of good stock. His hogs are very fine, his sheep very good, and his cattle very respectable, except the Khaisis. Considering that stock as possessing all the qualities that the best breeders have been trying for years to breed out of their cattle, we can but regret that Dr. Woods is wasting time on them. Barring this whim of his, he deserves all we have said of him, and this in addition: that he is a liberal man with his stock, and gives away almost as many as he sells.

Haw's Woodpecker Saw Mill.

In addition to what a friend has already said to us about the above machine, Dr. Wm. H. Macon of New Kent, who has one in successful operation, instructs us to say that, in preparing fencing plank as a substitute for rails, and in sawing for all plantation purposes, it is indispensible to him, and will be to all others who use it. Dr. C. W. Wormley of King William, also says the same. As to John Haw of Hanover—the maker of it—we have known him all our lives, and can truly say he is an honest man and a mechanical genius.

Peas for Fallow.

As there is an active enquiry for peas, we refer those in want to the advertisement of Thos. Branch & Sons, Petersburg: who have a limited supply for sale. They are very scarce and high, and those who want them had better apply early. To the tide-water farmer, who has no clover, and does not drill wheat, it is hardly necessary to say that they are indispensable. But they will not answer where wheat is drilled, at least until a new drill that we know of is made and brought into successful operation. Farmers from the upper country ought to try peas very cautiously as an experiment. We, when in Albemarle, Mr. Noland of Albemarle, Mr. F. Lewis Marshall of Fauquier, Mr. Old of Powhatan, and one or two others of that region have failed with them.

Corn Planter.

We are both pleased and sorry to hear from two agricultural implement-makers, that in consequence of our article last month on corn planters, they have been unable to supply the demand for them. We beg that those who have obtained them will notify us of their mode of action, as we have taken some responsibility in advising their purchase. We repeat to those who may see this in time, that they need not fear to use them in moderately cloddy land, as we first saw them at work in a field of Mr. Harvie's in Amelia, which was rougher than the Portsmouth and Roanoke Railroad.

Tobacco Plants.

Nearly all the early sown tobacco plants were killed by the hard spell which followed the

warm weather about the last of February; and the prevalence of cool weather since will make the plants on resowed beds late. But the management of plant beds has improved so much of late, especially in the use of guano, that there will probably be a better supply than is usual after such an untoward season. Still it must be short.

Emigration from Virginia to the West.

We have lately seen lugubrious accounts of the depopulation of large sections of Western Virginia by emigration to the West. However much it may be regretted, this emigration is not peculiar to Virginia. Ohio, Pennsylvania, and some other free States are suffering much more from the same cause than we are, and making much louder complaints about it than we do.

Richmond Cattle Market.

April 16, 1857.

Reported by Messrs. Crockett & Shook.

Beef cattle are bringing by scale weight from $4 50 to $6 50; and they will probably remain at these figures for the next six weeks. Hogs are worth $9; not much in demand. Sheep are in demand at 6c gross, with the fleece on, 4 to 5 with the fleece off.

☞ Book Notices omitted for want of room.

Horticultural Department.

E. G. EGGELING, Contributor.

Cauliflowers.

This vegetable, which is very highly prized in England, France, Germany, and in some of the Northern States of this country, is very little known in Virginia. Many persons who have seen it growing in our garden have mistaken it for cabbage, to which it bears a striking resemblance, except that its leaves are long like tobacco, and it grows to an enormous size, spreading out like the branches of a tree. These outer leaves however are not the parts of the plant which are eaten. The only portion which is brought to the table, is what we shall call the flower which grows out from the top of the stalk from the very midst of the leaves. Properly cooked and served up, it is a great delicacy, and as such deserves perhaps more attention than it has generally received hereabouts.

The seed may be sown at two periods, either in the month of September or in May. If sown in the fall, the plants are to be taken up before the cold weather of winter sets in, and planted in a cold frame, there to remain until the following spring, when they are to be removed to the open ground, and placed about three feet apart. This mode of raising them does not suit this latitude well, as the hot weather is likely to come on before the flower forms, when the plant runs up and fails to produce the flower, or if they are produced, seed are formed immediately, which equally unfits them for the table.

The proper season to sow the seed in this climate is about the first of May. They are to be sown in beds, just as cabbage seed are sown, and by the first of July ordinarily, the plants will be large enough to bear transplantation. They are then to be removed to the open ground and planted in rows three feet apart, and the plants to stand the same distance apart in the row.

To raise Cauliflowers requires that the lands be worked very deep, the clods well broken, and the soil rendered as light and pliable as possible, and most important of all, the land must be made as rich as it can be made with the application of good manure. This is so indispensable, that we advise no man to attempt to cultivate this vegetable at all, unless he will give earnest heed to this direction. It is idle to attempt to raise it on poor land, or even moderately rich land, for it requires an exceedingly rich soil, and will not flourish well in any other. The land should be broken with the spade, as the plough does not go deep enough, unless the land is ploughed time and again, and this is scarcely less troublesome than if the spade had been used originally.

When planted on land thus prepared, the chief cultivation required, is an occasional hoeing to keep them clear of weeds.

As the flower previously described, is the only part of the plant that is eaten, it is the great object of solicitude and care with the cultivator. It usually makes its appearance in the latter part of September, or the first of October, and when first developed is very small, and has somewhat the look of the head of asparagus when it first appears above ground. At this time it is entirely covered by the leaves of the plant, and would not be seen

unless these were lifted or pushed aside, and from this time it increases in size until it attains its maximum. The usual size is about as large as cocoanuts, though they are occasionally grown double that size. We have raised some which measured fourteen inches across, weighing several pounds. They are fit to be eaten when they measure from four to six inches across.

The development of this bud or flower may be considerably accelerated by stunting the plant, which may be effected in two ways. One is by running a plough moderately deep within six or eight inches of the plant on two sides, and throwing the earth from the plant. The other by taking a spade and chopping down into the earth, all round the plant, at a distance of from ten to twelve inches, so as to cut the roots of the plant at that point. Neither process however should be resorted to earlier than September or October, and when it is judiciously done, an early crop may be secured. At all stages of growth, this bud must be carefully protected from sunshine and rain, as either causes it to grow dark, and makes it tough. An effectual screen can be formed by bending over it some of the leaves nearest it.

Many, if not most of the plants, will either not bud, or very slightly, until the approach of cold weather. As they are delicate, they must be put away two or three weeks earlier than cabbage, and if this be properly done, the growth of the bud will continue during the winter. The best method of keeping them is that very generally adopted with cabbage, which is to take them up and ridge them, burying the roots and stalk up to the lower leaves of the plant, taking care however to gather all the leaves closely together, so that they will perfectly cover and protect the bud. This method of preserving plants is well known in Virginia, and needs not be particularly described. The plants must not be removed and put away thus in wet weather. A dry season should be chosen.

To shield them effectually from the frost, after they have been thus put away, cover them with dry oak leaves, five or six inches deep, and to keep these in place, cover with pine or any other kind of brush. In a few weeks all will begin to bud, and will soon be sufficiently matured for use.

We have been careful to give these minute directions for the cultivation of this vegetable, because it is esteemed a great delicacy, as indeed it is, as all will testify who have tried it. Housewives will find ample instructions for cooking, &c., in any popular cookery book which they may choose to consult. Besides being esteemed for the table, cauliflowers are valuable for pickling and as a seasoning for soup.

The Irish Potatoe Crop.

According to the census of 1850, the annual product of Irish potatoes in the State of Virginia, is 1,316,933, bushels. This may strike some minds as being a very large amount, but it will be seen to be very small, when we compare it with other authentic facts. Thus Maine raises 3,436,040 bushels of Irish potatoes, New Hampshire 4,304,919 bushels, Vermont 4,951,014 bushels, Massachusetts 3,585,384 bushels, Connecticut 2,689,725 bushels, New York 15,398,362, bushels, New Jersey 3,207,236 bushels, Pennsylvania 5,980,732 bushels, Ohio 5,057,769 bushels, Michigan 2,359,897 bushels, Indiana 2,083,337 bushels, Illinois 2,514,861 bushels, and the only States which raise so few, or less than Virginia, are Rhode Island, Delaware, Maryland, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky, Missouri and some of the partially settled territories and the District of Columbia.

From this it will be seen that there are twelve States of the Union, which raise from two to fifteen times as many Irish potatoes annually, as are raised in this State, and when we consider the fact that none of these have so many acres of land capable of tillage as Virginia, it will clearly appear that an annual crop is in reality inconsiderable and far below what it ought to be.

It may be supposed by some, that the crop at present made is amply sufficient to supply the demand, and this is the true reason why no more are raised in this State. Such is not the fact, however, as all persons residents in our cities may well know. Immense quanties are brought into Virginia from the Northern States every year, and judging from what we know are brought into Richmond, we should estimate the annual importation at much more than double the annual crop raised in this State. When it is considered that these potatoes are sold to dealers here at

about one dollar the bushel, an idea may be formed of the loss which our people sustain from the failure to cultivate this crop more largely.

Is there any just reason why we may not raise potatoes enough here at home to supply all the demands of our market? Previous to a late trip, which we made to Greenbrier county, we had supposed that there was a sufficient reason in the peculiar character of our climate and soil. Living here in lower Virginia, we are familiar with the well known fact, that it was impossible, or nearly so, to raise Irish potatoes in this latitude which would keep through the winter well, and that even when they were so preserved, they were not suitable for seeding purposes the ensuing spring. In our own case we had experienced these difficulties, and, in common with our neighbours, year after year, had been compelled to buy for seed, potatoes which were raised in the Northern States. Convinced thus by our own experience and observation of the impracticability of cultivating this crop, except as a spring and summer crop, in the tide-water section of the State, and ignorant of the vast capabilities of the Piedmont Valley and Trans-Alleghany districts, we are disposed to acquiesce in the existing state of things as a condition of affairs which could not be remedied, and are still of the opinion that Irish potatoes cannot be successfully and profitably cultivated in this portion of the State. It will pay to raise them even here for consumption in the spring, summer, and fall, but not to keep through the winter.

What we observed, during the jaunt before referred to, gave us entirely new ideas of what the State can do in regard to the Irish potatoe crop and of the remissness of our people in this particular. There we found a soil and a climate equal for this purpose to any in the world, and the potatoes grown so excellent in quality, and brought to perfection with so little trouble and expense, that we could only wonder and admire. Think of a soil into which you may drop the potatoe, and which is so well adapted to its cultivation that almost without work they grow off finely, yielding a half bushel to the hill, and sometimes producing so liberally that the rich deposit actually bursts the soil, as one gentleman assured us had happened on his farm repeatedly. And this too, occurring, as he told us, when the tuber was merely dropped in corn rows and left so without special care. And another, a gentleman widely known not only in Virginia, but throughout these United States, showed us potatoes of most prodigious size, grown on his farm, assuring us at the same time that they were raised with little trouble, yielding a most bountiful return. Facts like these coming to us from the most reliable sources, satisfied us that in the Greenbrier lands, and in other lands of like qualities, we have everything that could be desired, and we see no longer any reason why we may not raise in Virginia an ample supply of Irish potatoes.

As to the quality of the potatoe raised in this region, we speak what we know when we pronounce them to be unsurpassed in all the requisites of good potatoes by any raised any where, whether in this or the old world.

They are altogether different from the watery, insipid productions of our gardens and farms hereabouts, and as they are of necessity planted late, and matured late, they must possess those very qualities which will enable them to withstand the frosts of winter, preserve their good qualities, and may, for all that we can see to the contrary, entirely supersede the necessity of sending North for potatoes for spring seeding in tide-water Virginia. A little incident will perhaps confirm our judgment of the quality of these roots. Seeing some Irish laborers at work, and ascertaining on enquiry that they earned but seventy-five cents per day, we asked, "why don't you go to Richmond, where you can make double these wages," when one of them replied, his face beaming with satisfaction, "faith and you should see the praties they have here."

Heretofore the farmers of the part of the State to which we now refer, have had no inducement to cultivate this crop extensively, because shut in by the hills, they could find no market to which they could carry what they could not consume. This hindrance will speedily be removed, and it is in view of that fact that we call upon them to raise the potatoe in sufficient quantities to supply the market of our eastern cities and towns through the winter, and until the crop of the summer is sufficiently advanced for use. At present, in Richmond, Petersburg, Alexandria, Norfolk and other places from October to June, the whole

demand is filled with potatoes raised in New York or Maine, and during the greater part of that period they sell readily at prices varying from one to two dollars per bushel. Shall we ask in vain, that the large contributions thus levied on Virginia, by the Yankees year after year, be stopped, and the money which is now sent away, be retained within the borders of our own State.

If the information in our possession is reliable, there are a number of counties, above tidewater, lying along the Virginia and Tennessee Railroad, and on the line of the James River and Kanawha Canal, where this crop can be raised as readily as in Greenbrier. Will not the farmers in those counties take note of our appeal and govern themselves accordingly? Let them count the cost, and tell us what they can take from their soil which will pay them better than this crop of which we write. Is there anything, and if they answer negatively, as we are sure they must, will they not this year devote a larger space and more attention to the cultivation of this crop.

Very much of what we have written concerning the soil of Greenbrier, we know to be true of the lands about the Blue Ridge range. Two years ago we had occasion to remark, the excellence of the potatoes on the Blue Ridge at Rock Fish Gap, and we understood then, that at all points along the ridge, they grow well, and of a quality as good. In private interviews with some of the farmers of that vicinage, we endeavored to encourage the extensive culture of the crop, for sale in the Richmond market, but we do not know that the effort was crowned with any marked success, and we advert to the subject again in this place, with the hope that something better may come of it, and at a future day, we shall endeavor to show, even more conclusively than we have ever shown, that there is need here at home, for at least two millions of bushels of Irish potatoes more than are at present grown in the State.

In the meantime, we earnestly invite gentlemen in every part of the State, to give us the benefit of such information as they may possess cognate to any of the facts discussed in this article. It is surely well worth the attention of all the farmers and other citizens to ascertain what is the actual consumption of Irish potatoes in Virginia, over and above the actual production; what sections or counties of the State are best adapted to their cultivation, what profit may be realized from the crop, what are the best methods of planting, working and preserving, which are the best varieties for cultivation, in any latitude, and to what extent we can dispense with their importation from the States of the North? While we have no disposition to create or foster sectional prejudices among the people of our State, we are anxious to have our people raise whatever is needed for consumption in the State, so that to that extent we may be able to practice non-intercourse with our friends in Yankee land. And certainly, with all our broad acres and sturdy farmers, it is preposterous that we should be compelled to get our supply of Irish potatoes from non-slaveholding States, when we could easily raise enough, not only to meet our own wants, but to feed a world of Irishmen besides.

Watering Strawberries.

In general, we are opposed to the system of watering plants which some persons so much affect. Strawberries, however, require water in large quantities, and from our experience we are convinced that it is every way proper to give them water constantly and liberally even in the wettest seasons. It has been our habit for many years to water our strawberry plants, from the time that they bloom until the fruit is all gathered, and the beneficial results have been so marked and striking, that we cannot hesitate to recommend it to every cultivator. The advantages may be briefly stated, as securing much larger berries and increasing the crop fully threefold. Where water is freely applied almost every bloom will bring a berry, and the quantities which can be gathered from a small plantation are really astonishing, to those who have never tried the experiment. Those of our readers who doubt are earnestly requested to try an experiment of watering half their plants, and withholding water from the other half, and whatever may be the character of the season whether wet or dry, the results will be of the most surprising character.

The water should be poured from a sprinkling pot and should be plenteously bestowed. A slight application will do very little if any good. It may be applied evening or morning

as convenient, but never during the heat of the day, and all the trouble and expense will be amply compensated by the grateful return of improved fruit and an increased crop.

Manure for Fruit Trees.

Many persons in this State, perhaps it would not be amiss to say, must, when they have planted out trees in what they term orchards, neglect them altogether, as if they could thrive well enough without attention. Such fruit growers do not seem to consider that the trees draw all their sustenance and nourishment from the soil, and that this continual waste if not as constantly repaired, will inevitably sooner or later exhaust all these qualities upon which the tree must depend for its vitality and fruitfulness. They know that in order to make good crops they must manure the land on which they grow wheat, corn, tobacco and the like crops, but they seem totally unconscious of the desirableness of similar applications to the orchard.

A friend living near Richmond has a number of well grown, healthy, thrifty apple trees, which after bearing plentifully for some years, all at once became barren, much to his surprise and chagrin. After pondering the matter awhile, he resolved to see what effect manuring them would have. Accordingly he hauled manure to the spot, and after pulling up the soil, scattered it about the trees. The result was an abundant crop of fruit the ensuing season.

The best season for this application is the autumn, but where it was neglected then, it may be done with advantage now, and it is never too late to do well. Our advice is, always before putting the manure about the trees, fork up the earth well, as then the rains will dissolve it and carry it in a solution to the roots of the tree.

And this suggests the remark that liquid manure is the best kind for the orchard, and the further suggestion that soap suds, slop water and similar things which the farmer wastes usually, is an admirable manure for fruit trees. With but little trouble and less expense enough of this could be saved to answer any purpose.

It is proper to add that all fruit trees do not equally require manuring. Thus we all know that peaches thrive much better in poor soils than apples would, and this fact must not be overlooked. Excess here would not be less fatal than total neglect, and the quantity must be left to the sound discretion of each individual. Be it remembered meantime that some is absolutely indispensable, and the farmer who would have good fruit, must not altogether neglect his orchard. Of this let all take heed.

Encourage Home Production.

It is our purpose at some future day, when we have obtained the requisite data, to give some account of all the Nurseries in this State, with the varieties and quantity of trees on hand in each, and we hope to be able to show that there are enough fruit trees raised here at home to supply the demand, and to save our farmers the trouble and risk of going out of the State to get orchards. The object we have in view is certainly praiseworthy, at least we trust our readers will so consider it. They can but agree with us in the sentiment, that no Virginia farmer ought to buy abroad, what he can get on as good terms within the borders of his own State. A just pride demands this, let alone that his own interest demands it, and we ask all to wait until they have seen this expose, before ordering their supplies for the ensuing fall. Trees raised here in the soil and latitude in which they are to remain, must be better suited to the wants of Virginia fruit growers than those raised in a different climate and soil to that to which they are to be transplanted. This we could prove to the entire satisfaction of every unprejudiced mind, but it looks so like an axiom that it is perhaps useless to elaborate the argument. All we ask is that fruit growers will look at home before they resolve to buy abroad. Is it an unreasonable request?

Frosted Vegetables.

If vegetables, such as radishes, beets and the like, have been frosted by the cold weather which has visited us during the last month, we advise all persons to sow another crop immediately, even where those before sown have not been entirely killed. Our reason for giving this advice is, that such vegetables will soon go to seed, and unless others have been put in, they will last but a short while. Without attempting now to explain the why, we merely remark the fact, that nearly all our edible roots

when once frosted fail to endure the heat well, and soon begin to shoot into seed stalks and thus become unfit for food. Such at least has been our experience. They may be allowed to stand, but to guard against the result which is likely to follow, let others be put in. Such has always been our custom, and we have frequently found the advantage, when we had ample supplies, while our neighbours are entirely destitute. Nothing can well be more disagreeable than to be without vegetables, and there is no sufficient reason why any individual should find himself so circumstanced. A little foresight will ever prevent it.

Flowers for our Railroads and other Roads.

A traveller in France notes the fact, that at all the stations on the Railroad, between Tours and Paris, as well as on other roads, he saw neat and well-kept flower gardens, kept up by the railway officials, to serve merely as ornaments, which would attract and interest passengers, on the temporary stoppage of the train. Whatever may have been the motive which actuated the French railway men, it is a very pretty custom, which our Railroad managers in this country might advantageously imitate. There is scarcely one of our Railroads which would not be improved by the adoption of this custom. The ruling principle with our Railroad managers seems to have been to have every object on the line as hateful and unattractive as possible, probably for the purpose of deterring passengers from sticking their heads out of the windows, or from leaving their places when there is a stoppage. The only exception to this remark which we remember, is the justly lamented TUNSTALL, who happily blended utility and ornament in all the structures upon the line of the Danville Railroad, and if his successors shall be actuated by like good sense and good taste, this will be one of the most attractive public ways in the State.

It is perhaps idle to expect our Railroad companies to do anything in this behalf, unless they could be convinced that by adopting this custom, they would be likely to augment travel, as they are eminently utilitarian in their views; but may we not address ourselves more hopefully to private individuals living on the line of our Railroads. Why may they not give some attention to the cultivation of flowers, as well for the gratification of public taste, as for the improvement and adornment of their homes. A home without flowers always seemed to us to lack an element of grace and beauty which no contrivance could supply or remedy; and judging from the tenacity with which we cling to our memories of the buds and blossoms around our birthplace, we should say it lacks as well a strong and undying tie, which would charm the children of the family to the homestead. Make home cheerful, make home beautiful, give it shade-trees, and evergreens, and flowers, if you would have the children love home,—but neglect all these if you would have them unmindful of home, and your desires shall be gratified.

But we have wandered from our main purpose, which was, to put up a plea for flowers along the line of our Railroads and other roads. No man that has travelled in Virginia, can have failed to observe the air of sternness and repulsiveness which our farm-houses wear, for the want of a little attention to ornament. One journeys day after day, without meeting with a plat of rich-tinted roses, the graceful honeysuckle, or woodbine,—but all is barren and bleak; houses, fences, and out-buildings stand naked and drear, and there is nothing to relieve the eye, or to excite pleasant emotions, unless it chance that the fields are waving to the harvest. How much would the pleasure of travel be enhanced, if every farm-house had its flowers and flowering shrubs, stately shade-trees, clambering vines, hiding unsightly objects, and giving a grace and beauty to all, which the dullest nature can appreciate and admire. Nothing impresses a traveller in the old world more gratefully, or makes a deeper impression upon his mind, than the flowers which he sees surrounding every dwelling, as well the hovel as the palace, and consequently we find every traveller making constant allusion to this peculiarity. Why may not Virginia people be equally noted for their love of flowers?

Let us have flowers about all our homes, but especially, dear friends, let us have them all along the line of our Railroads and other roads. About four miles from Petersburg, there is a farm, which never fails to attract the notice and to elicit the commendations of every passenger who happens to be seated on the side of the car from which it can be seen in passing; and we have heard hundreds give utterance to a wish for just such a place for a home. Yet it has no peculiarity beyond this, that the proprietor has beautified the grounds about the house, with grass, cedars, hollies, and other evergreens and flowers; and after passing series of homes whose owners give no heed to these things, this spot comes into view like an Oasis in a desert, and elicits universal admiration.

LIST OF PAYMENTS

From March 23, to April 22.

All persons who have made payments early enough to be entered, and whose names do not appear in the following receipt list, are requested to give immediate notice of the omission, in order that the correction may be made in the next issue:

Jno McRae, Jan 1858 $1 00
Jno W Goss, do 2 00
S W Outlen, Nov 1856 2 50
W D West, Jan 1858 2 25
B F Hudgins, July do 5 00
J M Conway, Jan do 2 00
Dr Geo Field, do 1 00
Wm F Gunn, do 1 00
Jno Wickham, do 4 92
S Rixey Jr, do 2 00
Ro Meredith, do 2 00
Ro Collins, April 1857 3 13
J H Jameson, 15 March do 1 00
J A Scott, Jan 1858 2 00
J R Thompson, do 2 00
M McFerran, Feb do 5 00
Wm M Turner, Apr 1857 2 50
Dr J R Taylor, Jan 1858 4 00
Rev Wm Crawford do 1 00
R A Hill, do 2 00
C S Hutcheson, May do 5 00
Edw'd Carter, Jan do 2 00
G T Cralle, do 1860 5 00
Rev J McDonald, do 1858 2 00
Wm Bosher, do 2 00
Jno Robertson, do 2 50
S W Montgomery, do 1857 2 50
H C Land, do 1858 3 00
T S Garnett, do 2 00
R Sampson, Oct do 5 50
Wm T Walker, do 4 50
J C Laird, Jan do 3 25
E T Morris, do 1 75
Miss A M Moon, do 1 00
Mrs M F Brooks, do 3 25
Jas T Redd, do 2 00
W W Oliver, do 3 46
U Herbert, do 3 00
B W Bass, do 3 00
Col Chas Conner, do 3 00
Jno Grasty, do 2 00
Hedges, Mockbee, & Co., Jan 1858 2 00
J Ferneyhough, Jan 1858 3 00
Jas H Chowning, do 3 00
M F Finks, do 2 00
O Finks, do 2 00
H E Weston, do 2 00
Col J McClanahan, do 2 50
R Lipscomb, do 2 00
T H Brown, April 1858 2 25
B E West, Jan 1858 4 19
Jos P Terrill, Jan 1858 3 25
Jas A Bruce, Jan 1858 1 42
Jno Workman, Jan 1858 2 00
J A Earley, Dec 1857 1 00
J W Hill, Jan 1854 10 00
Dr H Field, Jan 1858 1 83
Jas M Spiller, Jan 1858 2 00
Geo W Doswell, Jan 1858 4 50
Ro Pollard, Jan 1858 2 00
S D Tucker, Jan 1858 2 50
Jno A Montague, Jan 1858 2 00
R W Wheeler, Jan 1858 4 50
Wm Matthews, Jan 1858 2 00
M C Pegnes, Jan 1858 2 00
A Pointer, Jan 1858 1 00
Jno R Quarles, Jan 1858 1 00
Dr J Michaux, Jan 1858 2 00
D M Wharton, Jan 1858 2 00
Mrs E M McDonald, Apr 1861 5 00
J H Rowlett, Jan 1858 2 00
J C Boxley, Jan 1858 $2 00
Wm H Eubank, Jan 1858 1 50
Wm S Dupree, Jan 1858 1 50
Wm T Ballew, Jan 1858 2 00
C C Tinsley, Jan 1858 2 00
Wm Smith, Jan 1858 1 00
G O Markham, Jan 1858 2 00
Dr R H Nelson, Jan 1858 2 00
R A Taylor, May 1858 5 00
M Tutwiler, Oct 1857 3 00
D J Hartsook, Nov 1857 2 00
Dr W D Boarz, Mar 1857 3 00
J B L Williams, Jan 1856 1 25
R W Tunstall, Jan 1858 1 83
B Vaughan, Mar 1858 2 00
J H Vaughan, Jan 1858 2 00
W P Shepherd, Jan 1857 1 00
Jno T Childrey, Jan 1858 2 00
Wm S Carter, Jan 1858 2 00
W S Fontaine, Jan 1858 3 00
Wm A Sweet, Jan 1858 2 00
Wm C Peatross, Jan 1858 2 00
Jno Burr, Nov 1857 1 00
Dr J D Spraggins, Jan 1858 2 00
P Reynolds, May 1857 2 08
Geo S Blakey, Jan 1858 1 50
F Saunders, Jr, Jan 1860 5 00
Ro B Moorman, Oct 1858 5 00
T N Clarke, July 1856 5 63
Wm N Williams, July 1857 5 00
H Harrison, Jan 1858 2 50
Laney Jones, Jan 1858 2 00
Wm B Davis, Jan 1858 2 00
Ro L Brown, Jan 1858 2 00
C B Claiborne, Dec 1858 5 00
D M Wood, 15 July 1857 3 00
Sam'l T Miller, Jan 1858 2 00
T H Walthall, Jan 1858 2 00
W M Wingate, Oct 1858 3 00
Mrs A J Harrison, Apr 1858 2 00
R W Williams, Jan 1858 5 00
Wm G Maddox, Jan 1858 2 00
Jno Strong, Jan 1858 3 17
Wm M Payne, Jan 1858 2 00
J R Jones, Jan 1858 1 83
J C Browder, Jan 1858 2 00
Jas Miller, do 3 25
W B Barley, do 4 00
Dr R S Apperson, Jan 1858 3 87
Dr M Pendleton, Jan 1858 3 25
D C Anderson, Jan 1858 1 00
N B Gay, Jan 1858 2 33
W W Alvis, Jan 1858 2 00
G W Taylor, Apr 1857 2 00
Geo Payne, Jan 1854 1 25
Jos L Watkins, Jan 1858 1 75
A S Barksdale, Jan 1858 2 62
E F Redd, Jan 1858 1 67
Dr D C Jones, Jan 1858 14 50
F K Nelson, Jan 1858 1 00
Jos Tuley, Jan 1860 5 00
Nicholas Mills, Jan 1858 2 00
J Jones, Jan 1857 1 00
T J Hodnet, Jan 1858 2 00
C H Winfree, Jan 1858 2 00
Mrs L C Binford, Jan 1858 1 84
W C Jones, July 1857 1 00
E T Page, Jan 1858 2 50
J B Whitehead, Jan 1858 2 00
C D Gray, July 1856 5 00
J T Butler & Co, Jan 58 2 00
Wm A Turpin, do 2 00
B F Randolph, April 1860 $5 00
Bland Rea, May 1857 7 08
A Edwards, Jan 1858 2 00
Jos W Butler, May 1858 3 00
L C Botts, Jan 1858 2 00
Dr S S Griffin, Jan 1858 2 00
A Burton, Jan 1858 2 00
E D Christian, Jan 1858 2 00
Ro B Thompson, do 2 00
Wm A Dandridge, Apr 1858 1 25
E H Herbert, Jan 1859 3 00
Dr L Roane, Jan 1858 3 25
J W Gresham, do 2 00
T Michaux, do 2 00
J C Thom, July 1858 2 00
Geo W Fones, July 1856 4 79
G H Dashiell, 15 June 1858 5 00
Jas M Harris, Jan 1858 2 00
Col D B Hancock, Jan 58 2 00
M B Jarman, do 3 00
A K Bowles, do 2 00
G R Calhoun, Oct 1857 1 00
B A Donald, July 1860 6 00
Dr F W Power, July 1856 3 75
P M Tabb, Jr, Jany 1858 2 00
G Hanes, do 2 00
P Woolfolk, do 2 00
J R Micou, do 3 25
R U Brooking, do 3 25
M H Effinger, do 2 58
W E Clopton, do 2 17
L B Price, do 2 00
H E Coleman, do 2 16
Dr G W Glover, do 2 00
D H Hatton, July 1858 2 00
Capt Wm Walden, Jan 58 2 00
L Flippo, do 2 00
J T Harris, do 2 00
P P Nalle, July 1858 2 00
Thos Paramore, July 1858 3 00
Thos L Trower, May 57 2 00
E Ruffin, Jr, Jan 60 5 00
Thos Carroll, Jany 1858 2 00
Jas T Twitty, do 2 00
Jas C Hart, do 2 00
Jno L Andrews, do 2 00
Hart & Hayes, do 2 00
J Michaux, May 1857 2 70
Hon B Brown, Jan 1858 2 00
Wm Cowherd, do 2 00
D Witt, do 2 00
J B Lightfoot, July 1857 2 00
J M Waller, July 1857 1 00
Ro Wilkinson, Jan 1858 2 00
C S Gray, do 2 00
R G Grigg, do 2 00
W C Carrington, do 2 00
Ro Marks, do 2 00
B Burwell, May 1857 83
J A Clark, January 1858 2 00
Jno D Hunt, do 5 34
Jno L Cowherd, do 2 00
C B Killebrew, do 2 00
D B Sanders, A Sanders, Ro Jackson, S D Sanders, R W Sanders, Jno Sanders, Jan 58 10 00
T S Watson, Jan 1860 5 00
Jos Alsop, do 5 00
W F Wickham, Jan 1858 3 25

SOUTHERN PLANTER ADVERTISING SHEET.

Our readers will find much to interest them in the advertising columns of the "*Planter.*" We call their attention to the following "*New Advertisements*" to be found in this number:

Jos. Segar makes known the attractions of that "Elysium" of Summer Resorts, Hygeia Hotel, Old Point Comfort, Va. His advertisement will speak for itself and be found on page 2

J. M. Thorburn & Co., of New York, offer a large and varied assortment of agricultural, garden and flower seeds, 3

Also an importation of Northern Sugar Cane Seed grown in France, 5

Stebbins & Pullen, Richmond, offer the Gas Apparatus of the Maryland Portable Gas Company of Baltimore, 3

W. W. Dingee & Co., York, Pa., offer 100 one and two horse Railway Powers and Threshers, 4

Doyle & Sullinger, Fredericksburg, offer Doyle's Patent Grain Cleaner, 4

E. P. Nash, Petersburg, says there is "No risk in trying a Piano," and requests you to "suspend your decision as to the purchase of one until you can test those" offered by him, 4

Dr. D. B. Sanders, Jackson's Ferry, Wythe Co., offers 3 or 4 Pure Blood Short Horn Bulls, by "Norfolk," 4

C. S. Wainwright, Rhinebeck, N. York, gives notice of his "first public sale of thorough-bred North Devon Cattle, to be held at "The Meadows," on the 17th day of June 1857," 4

Thos. Branch & Sons, Petersburg, offer 1,000 bushels Clay and Shinney Peas for sale, 4

N. August, Richmond, offers "a desirable Farm" in Cumberland county, on Willis' River, containing 228 acres, 4

W. R. Prince & Co., Flushing, N. Y., offer Fruit and Ornamental Trees and Plants, Chinese Sugar Cane, Seed, &c., 4

C. M. Saxton & Co., New York, Agricultural Book Publishers, offer their great original "American Works on the Horse," and a variety of Works on the culture and management of Fruits, Flowers, &c., 5

Geo. Chambers, Chambers' Mills, offers "Valuable Farm and Milling Property," in Buckingham county, containing 600 acres, 5

Wm. Frazier, Rockbridge Alum Springs, gives notice that he is enlarging the accommodations of this favorite and celebrated watering place, and urges invalids who really require the use of the water, to avail themselves of the early part of the season when more comfortable accommodations, &c., can be secured, 6

W. C. Jones, Surry C. H., offers a tract of 732¼ acres valuable timbered land in Sussex county, on the Norfolk and Petersburg Railroad, 9

Frank: G. Ruffin, Chesterfield, has for for sale Three Quarter South Down Ram Lambs, (see cover,) page 4

H. M. Smith, Richmond, offers "Dewey's Patent Gleaner," an implement highly approved and recommended by those who have used it, 6

Also his Threshing Machines, 7

Also his Reaping Machines, 9

E. H. Skinker & Co., Richmond, Grocers and Commission Merchants, offer a general stock of Groceries, Iron, Tin Plate, Peruvian and Mexican Guano, and other fertilizers. DeBurg's Manipulated Guano, 7–8

Baldwin, Cardwell & Co. Richmond, give notice that they continue to manufacture all kinds of agricultural machines and implements, and call attention to "Cardwell's Horse Powers and Threshers," "Croskill's Clod Crusher," "Manny's Reaper and Mower," 7

John S. Reese & Co., Baltimore, offer "Reese's Manipulated Guano," which they say "has been used with *unequalled results on Tobacco.*" E. T. Winston & Co. are the agents for the sale of this fertilizer in Richmond, 7–8

P. H. Goodloe, Albemarle County, Ivy Creek Land in Market, 9

Three-Quarter South Down Ram Lambs.

We have for sale, at $15 each, six or eight very likely lambs of the above breed, of the stock of Mr. R. H. Dulaney of Loudoun. We last year advised those who affect this breed of sheep, to purchase the thorough breed at three prices instead of part-bred stock of our own or any one elses; and do so still.—But those who will not do that, had better buy of us than continue to use natives. They are in-and-in bred—the sire on his offspring, which we state, that those who dislike this mode of breeding may not be taken in.

FRANK: G. RUFFIN.

E. T. WINSTON & CO.,

Sole Agents in Richmond, Va., for

Reese's

MANIPULATED GUANO.

April 1857.—tf