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. P. D. BERNARD, Publisher.

Vol. XIV. RICHMOND, FEBRUARY, 1854. No. 2.

VIRGINIA STATE AGRICULTURAL SOCIETY.

The following Premium Essays are published in continuation of the Proceedings of the first annual Exhibition of the Virginia State Agricultural Society, contained in the January number of this journal.

The order in which they appear is in conformity to the schedule of premiums. We commend them to our readers as highly meritorious and worthy of their careful perusal.

Branch I.

EXPERIMENTS.

Specification No. 1.

Experiment to test the Effects (in profit or loss) of the usual mode of Saving Corn Fodder, &c.

Sept. 6th, 1853.—In a field planted in corn, 5 by 4 feet, 2 stalks to the hill, through a portion of it as equal in fertility as I could select, marked off 24 rows, 577 yards long—the whole occupying 4.71 acres of land. The following arrangements adopted to equalize any imperceptible change in fertility, viz.

Lot *a*—3 rows, fodder to be pulled and tops cut—corn standing.

Lot *b*—3 rows, fodder to be pulled, corn cut down and shocked.

Lot *c*—3 rows—no fodder to be pulled—corn to be cut down and shocked.

Lot *d*—6 rows—to be left standing with all fodder.

Lot c—3 rows—part of lot *c*.

Lot b—3 rows—part of lot *b*.

Lot a—3 rows—part of lot *a*.

Sept. 7th.—Fodder being in good state for it, pulled the fodder from rows 1, 2, 3, 22, 23, 24 or lot *a*.

Also pulled fodder from rows 4, 5, 6, 19, 20 and 21, or *b*.

Sept. 8th.—A hard rain last night which drenched the fodder.

Sept. 9th.—Rain nearly all day, which again caught the fodder before it was dry from rain of Wednesday night.

Sept. 14th.—Cut the tops from lot *a*.

Cut down the corn of lot *b*, below the ear and about 2 feet above the ground and immediately shocked it.

Also cut down in same way the corn from rows 7, 8, 9, 16, 17, 18, or lot *c*, and shocked it—the fodder being somewhat passed its prime.

To-day secured in a house to itself the fodder pulled from lot *a*—much damaged by rains.

Lot *d* consists of the 6 middle rows and will stand with all fodder on, till cut down to sow wheat.

Sept. 17th.—Housed the tops from lot *a*.

Oct. 31st.—Weighed fodder from lot *a*, 390 lbs.

Weighed tops from lot *a*, 493 lbs.

Gathered and carefully measured the corn from each lot—each to itself. Lots *a* and *d* still standing.

Lot *a* yielded 33½ bushels shelled corn.

Lot b yielded 40 bushels, 1½ pecks shelled corn.

Lot c yielded 38½ bushels shelled corn.

Lot d yielded 42 bushels, ½ gallon shelled corn.

The corn was measured in the ear, shaking the measure when about half full and rounding off the top.

I also weighed carefully one struck half bushel of each lot.

a weighed 29¼ lbs. to the half bushel.

b weighed 29 lbs. to the half bushel.

c weighed 29 lbs. to the half bushel.

d weighed 29¾ lbs. to the half bushel.

There may possibly be some error in the above measurements and weights, but I personally superintended the whole experiment, and am not aware of any.

COMPARISON OF PRODUCTS.

Lot *a*, 33½ bushels corn at 60 cts.	$20 10
390 lbs. fodder (damaged) 50 cts.	1 95
493 lbs. tops at 37½ cts.	1 85
	$23 90
Lot *b*, 40 bushels, 1½ pecks shelled corn at 60 cts.	$24 22
Fodder equal to that of lot *a*,	1 95
Tops worth three-fourths as much as lot *a*,	1 38
	$27 55
Lot *c*, 38½ bus. shelled corn at 60 cts.	$23 10
Fodder worth the tops and fodder of lot *b*,	3 33
	$26 43
Lot *d*, 42 bus. ½ gal. shelled corn,	$25 24
The fodder worthless from exposure.	

I have made no estimate of the value of the shucks, but it is plain that the shucks of lots *b* and *c* must be more valuable than of the others, being cured in shade and secured from weather. I put the value of tops, of lots *b* and *c*, at three-fourths of those of *a* on account of additional luggage in the handling—and I have put the fodder of lot *c* as only equal to the damaged fodder of lot *a*. Lot *c* furnishes a large amount of excellent forage, but in a more unwieldy shape than if pulled. This differ-

ence, it is believed, would be fully balanced by superior excellence of the shuck. Bringing the lots together we have—

Lot *a* yielding	$23 90
Lot *b* yielding	27 55
Lot *c* yielding	26 43
Lot *d* yielding	25 24

Some difference in the land must account for the greater productiveness of lot *b*. If so, comparing *a* with *c* and *d*, would show that nothing is gained by pulling fodder, even though it should escape rain and command its full value.

I have said nothing about the expense of each of the different operations, nor do I deem it necessary to make a nice calculation of such expense, for a glance must show that it is much cheaper to clear a field for wheat, at one single operation of cutting down corn, fodder and all, than by three distinct operations of pulling fodder, cutting tops and cutting down corn. After trying it for several years I would not put the cost in labor at much more than one-third.

It is worthy of note that there was but little rotten corn in either of the lots, but decidedly most in lot *d*, where I would least expect it. Each lot *a*, *b*, *c*, had about a half dozen rotten ears, and *d* about three times as much.

EDMUND RUFFIN, Jr.

Specification No. 3.

Experiment to test the Action of Lime as Manure above the Falls of the Tide Water Rivers of Virginia on Different Soil.

Considering Lime as the only sure foundation for any system of farming which looks to the renovation of *worn-out*, or to the enriching of *any poor* land, I will give my experience of thirty years in the successful use of that auxiliary.

Lime, practically speaking, is not of itself a manure, yet at the same time no soil, other than alluvial, annually flooded, can be certainly fruitful and *permanently productive* that does not contain a due portion of lime in some form or other, to be absorbed by the rootlets of plants for the perfection of both straw and grain. I have known some curious blunders and much detriment to the progress of liming, by the use of *lime as a manure in comparison* with strong putrescent manures; for instance, a shovelful of each, was, by a novice, put on the hills of alternate rows of corn. The first effect of such ill-judged experiments need not be told.

Another common error, and one little less fatal to the general use of lime as an auxiliary renovator is, that it must be applied in quantities so large, as to interdict its use by most farmers who derive their support entirely from an exhausted soil.

I was a great sufferer under this popular error. When I commenced farming, there were but few, if any, *native* periodicals devoted exclusively to agriculture and adapted to the wants of our own country; consequently, we had to look abroad for agricultural light, which when received, was illy adapted to our resources, our climate or our worn-out lands.

The English works with which we were most familiar, told us of liming by the 1, 2, 3, 4, and even 800 bushels per acre, and in Pennsylvania, where liming was first brought into much use in the U. States, 40, 60, and 120 bushels per acre were generally administered. I adopted as my standard 40 bushels per acre, and I have, occasionally, applied 60, and as much as 80 bushels on one occasion. The result was highly satisfactory in each case, but the expense was entirely beyond the means of most farmers. Long experience and close observation have satisfied me, that lime, in far smaller quantities than is generally supposed, may be applied in various ways and with great advantage. I have had good results and lasting benefits from the application of as little as 15, and even down to *five* bushels of fresh burned lime per acre, mixed with three or four times its bulk of *road* scrapings and even of virgin clay, dug out of banks on road-sides incorporated with lime and spread on grass land, in autumn. Lime thus neutralized by clay or earth forms a most valuable ingredient for making compost; a single bushel of lime well mixed with ashes, dry earth and the like, to prepare it for sowing by hand, applied to one acre of wheat and harrowed in with it, on land destitute of lime will have a very salutary effect in hardening the straw and producing well-filled heads.

When the farmer is near enough to kilns to get the *fine* lime fresh drawn, and can get it on the land before it slakes, thirty bushels of that sort will be still better than the larger quantity slaked, but he should be very careful not to let any lime get wet before it is spread and *harrowed* in; but if he is so remote from limekilns as not to be able to haul more than one load a day, it will be better to buy the fresh burned and best lump lime; because in that state it is much lighter, and when water-slaked will increase from three to fourfold. Such lime ought to be put under cover and slaked immediately with strong brine. Lime of the quality described, and treated accordingly, acts very *promptly*, mechanically as well as chemically; mechanically, in reducing stiff, rigid clays to a loose friable texture, and chemically, by neutralizing acids unfriendly to vegetable production, and by combining with loose and light soils, they are rendered more adhesive and retentive of moisture; in other words, lime, judiciously applied to stiff land, renders it light, while it imparts to land too light, a firmer or more compact texture. This dogma, paradoxical as it may appear to many, is fully established by every brick chimney or stone dwelling in the land. All who build such houses know that lime and sand (the latter largely predominating in all light soils) with water, are the materials used by masons for the formation of mortar, which in a short time becomes as hard, if not harder, than the bricks. It is also well known that if stiff clay or rich mould were to be used with lime for mortar, instead of sand, when dry it would moulder away, and become impalpable dust. Now with these plain truths before us, it is only necessary to apply smaller portions of lime to our lands, varying according to their texture, and we can have stiff or light land, as we may choose.

My first experiment with lime as a fertilizer began in 1822, with a single bushel applied to the one-sixtieth part of an acre, accurately measured, in the midst of a fifteen acre field. It was harrowed in with wheat in autumn; on which clover seed was sown the following spring. The land had been *thoroughly exhausted*, and the effect of the lime on the wheat was not very striking, and would not have been noticed by a common observer, in fact, I was myself a little disappointed, although there was upon closer examination, a decided improvement in the *quality* of *grain* and *strength* of straw. But when the clover began to blossom, next year, this acre was definable by the most casual eye at half a mile; the amount of clover being at least double on the limed acre. The spot is still traceable, although the whole field was some years afterwards limed with sixty bushels per acre, and has been heavily cropped ever since.

Encouraged by this experiment, my next applica-

tion was sixty bushels per acre, for turnips. The season was a *very dry* one and there were no other turnips made in the neighborhood. A portion of my seeding *on ground which was not limed*, failed entirely. This has occurred several times with me. I have never had an acre of corn to fire or fall below an average crop on limed land, however dry the season may have been. Harrowing in 20, 30, or 40 bushels of lime per acre, in the spring of the year before seeding oats, or planting corn, with a bushel of Plaster of Paris applied to the young plants soon after they are well up, will insure, with me a full average crop in the dryest season, and especially when the land has been *subsoiled*.

THOMAS AP C. JONES.

Near Prospect Hill, Fairfax county, Virginia. October, 1853.

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Specification No. 6.

Experiment in the Tillage of Indian Corn.

It is the practice of many good farmers to break up their land for corn the preceding autumn. My experience teaches me differently. I have always found that *blue* grass turned over in autumn, was not killed by frost, and gave a *deal* of cross-ploughing and other work in spring, to get the ground in good order for planting, and a great dealmore work in after-culture, than when the *sod is turned under as short a time as possible before planting:* besides this, you lose your best pasture, for sheep in particular, from early frost in autumn, till March; say, on an average, four months in every year.

But whether you break up corn land in spring or autumn, it must be well done to insure a good crop. The depth of ploughing must depend on two things; first the depth of soil, which should always be kept *uppermost*, and secondly, by the ability of the farmer to use a two or three horse plough; but at all hazards, he must subsoil, if he expect to insure an average crop in dry seasons, and lime, too, if his land is deficient in that fertilizing auxiliary.

Supposing the ground to have been broken as directed, and left in the rough state, till the time of planting approaches, which is better indicated by *nature* than by the *almanac*, or than any man's notion of a particular day: for if you plant too soon, that is, before the ground is warm enough to sprout the seed quickly, you will, assuredly, have much replanting to do, which is sometimes attended with more labor and expense than the first planting. If you plant too late, the culture of your corn will interfere with your clover and grain harvests, and your corn may be injured by early frosts; so that, as in most other acts of man, a middle course is best for planting. In this and like matters, we may profitably follow nature's laws. I have found the budding and blossoming of forest trees a good criterion for planting corn and sowing some seeds; for instance, when the leaf of the tulip, or wild poplar tree is the size of half a dollar, Indian corn may be safely planted, and when the chestnut blossoms are fading, buckwheat may be sown with a fair prospect of a good crop.

As short a time as practicable before planting corn, the ground should be rolled and thoroughly harrowed* and then marked off for planting at such distances as may be determined on, according to soil, situation and climate. I plant as close as I can, to allow room for after-culture. The poorer the land, the closer I plant, regulating the number of stalks to the acre, by the number left in the hill, rather than by the distance between the hills of checkered, and the rows of stepped or drilled corn. Twelve hours, at least, before I intend to commence planting my corn I dissolve half a pound of copperas in some boiling water, into which I pour about a gill of tar, add as much more water as will make thirty gallons, then put the seed corn in. Stir it well and allow the corn to soak twelve hours at least. When ready for planting take the corn out and let it drain a while; then roll it in plaster of Paris, and put five or six grains in a hill. It will not be long coming up, nor much troubled by crows and the like, and will seldom require replanting.

The next process, if the land was not subsoiled when broken up, is, to run a naked, sharp coulter as near the corn, on each side, as a horse can walk, and as deep as he can draw it. This done, as soon as the first planting is large enough to thin, run your two horse heavy harrow over it, following at the same time, with *hand-hoers* to thin and draw a little earth about the remaining plants. Without any other cultivation than this, excepting a handful of plaster, wood ashes and lime, applied on the hill, after covering, I have made eleven barrels of corn to the acre, from several acres. As a general rule with me, the culture of Indian corn after it is planted, consists in *surface* culture altogether, taking care never to disturb the sod if any was turned under, and above all, never stir even the surface of corn ground when wet. A good general rule, alike indispensable to preserve the fertility of the land and to insure good crops, is *not to work corn unless the dust will follow the plough*, nor after the roots have extended so far as to be disturbed by the implement. Strict adherence to these rules for the cultivation of all summer crops, will not only insure fair crops in *any season*, but will redeem that most valuable grain, Indian corn, from the unjust charge so pertinaciously insisted on by all *bad* farmers, of "*robbing mother earth of her native fertility and rendering her powerless to produce.*"

I have known some farmers of high reputation in Virginia and Maryland, and deservedly so, in all things except the culture of Indian corn, who born and reared in the tide water districts of those States, have their *day of the month* and *day of the week* to commence corn planting, and a fixed number of times of ploughing before "*laying by.*" One of this old school, a most successful renovator of the soil, now no more, who spared neither pains nor expense in his operations, *limed, manured* heavily, used guano freely, *subsoiled* and ploughed extra deep, but *would break his corn ground in autumn*, cross plough it in spring, *plant early*, and *coulter* and plough it *four* or *five times*, and until the tassel made its appearance. Three years ago, after my neighbor had planted his corn, I offered him *ten barrels per acre*, if he would allow me to cultivate it in my own way; he declined, expecting fifteen or eighteen barrels, and went over the corn with one implement or another five times. The growth of the corn was heavy, but the ear was light, the product scarcely ten barrels per acre.

The same season, with not one-fourth of the cost in manure or labor, I made on *no better land*, fourteen barrels and a half on several acres, and on one and a half acres over seventeen barrels per acre; and my land came out better than when the corn was planted, while my neighbor's was not a little worsted. My corn was followed next spring by barley, thirty-five bushels per acre. (The barley stubble turned in and wheat sown in October—product twenty-five bushels per acre,) and my land is now well set in clover and timothy.

* If guano or any of the concentrated manures sown by hand, or lime are to be used on the corn land, they should be applied to the *rough*, *broadcast* before *rolling* or *harrowing*.

I am satisfied if my neighbor's corn had not been disturbed after it was thinned, and hand-hoed, he would have made at least fifty per cent. more, or fifteen instead of ten barrels per acre.

The past season (1853) in a great drought, when a portion of my corn land become very hard, and I apprehended the worst consequences, the land having been merely coultered before planting, *not thoroughly subsoiled*, I injudiciously set in the single barshare, throwing the mould next the corn, and split the middle with the double shovel. Luckily, this operation was soon stopped by a genial shower, but the mischief had been done to the few rows so treated, for although up to that time the corn in those rows on the best land, had looked well and promised better than on any other part of the field, the product was at least twenty per cent. below the other portion of the cut, which was but twice passed over by the double shovel or cultivator.

Heavy crops of corn are said to be raised on the western prairies by the simple process of ploughing deep and thoroughly inverting the sod, and then, with a sharp instrument, making a hole on the reversed furrow, then dropping and covering the corn and leaving nature to do the rest. If this be true, it is an instructive lesson, and one which I have endeavored to follow, as shown in my "Essay on the Improvement of Worn-out Lands."* 'Tis true, we on the Atlantic board have not the prairie of the West, but, by my six-field system which appropriates each field to at least two years successive close grazing, to be followed by corn, we have an artificial prairie, which treated as I have recommended, has never failed, with me, to bring fifty per cent. more corn than can be produced by any other mode of cultivation practised in the old States.

THO. AP C. JONES.

Fairfax County, Va., October, 1853.

Specification No. 8.

Experiments on the Benefits and Products of Guano, compared to costs.

I submit to the Virginia State Agricultural Society the following experiments on the benefits and products of Guano, compared to costs, and in doing so, I wish to be considered a competitor for the premium offered on that subject.

1st. The first week in October, 1850, I sowed on ten acres of fallowed land ten bushels of blue stem wheat, applying at the same time 200 lbs. of Peruvian guano per acre. The wheat and guano were both ploughed in together with single horse ploughs, and then harrowed. The yield was 240 bushels of good wheat, or 24 bushels per acre and to the seed of one. The land on which this experiment was made, was very poor, and would not, under the most favorable circumstances, without the guano, have yielded five bushels per acre. Two years before, it yielded less than a barrel and a half of corn per acre. The guano cost me $47 87½ the ton of 2240 lbs. delivered at my landing, or $4 27½ per acre.

2d. Between the 1st and 15th of November, of the same year, I sowed on thirty acres of corn land twenty-five bushels of the early purple straw wheat, applying at the same time 190 lbs. of Peruvian guano per acre. Both the wheat and guano were ploughed in with single horse ploughs, and left just as the plough left them. The yield was 600 bushels of wheat, or twenty bushels per acre, and twenty-four bushels to one of seed. The land on which this experiment was made, was poorer than that on which the preceding experiment was made. The cost of the guano was the same per ton, and $4 06 1-12 per acre.

3d. The last week in October, 1851, I sowed seven bushels of blue stem wheat on six acres of corn land, applying at the same time 225 lbs. of Peruvian guano per acre, and ploughing in both wheat and guano with single horse ploughs. The land was then rolled with a heavy log roller. The yield was 144 bushels of wheat, or twenty-four bushels per acre. This land would, probably, have produced five bushels per acre without the guano. The corn had been manured in the hill, and yielded about four barrels per acre. It was not measured. The past summer this land was covered with clover knee high. The cost of the guano was $49 00 per ton of 2240 lbs. or $4 92 1-6 per acre.

4th. The last of September, 1852, I sowed on nineteen acres of land, which had been fallowed in July and August with a heavy two horse plough, twenty-three bushels of blue stem wheat, and applied at the same time 220 lbs. of Peruvian guano per acre. Both wheat and guano were ploughed in as in the preceding experiments. The land had been harrowed before the wheat and guano were sowed. The yield was 520 bushels, or twenty-seven seven-nineteenth bushels per acre. This land consists of the ten acres mentioned in the first of these experiments and nine acres adjoining. About two-thirds of it was guanoed in the fall of '48, and the whole was guanoed in the fall of 1850. These previous applications of guano had greatly improved the land, and it would probably have yielded from eight to ten bushels of wheat without the aid of further manuring. The costs of the guano was $43 32 per ton of 2000 lbs. or $4 76½ per acre. It is proper that I should state, that the greater part of the wheat grown on this land (four-fifths of it) was exposed to the long rains which fell during the latter part of the summer, and a great deal of it was thrown away in the straw. The guano and wheat, in all of the above experiments, were ploughed in from two to three inches deep. No gypsum was used with the guano.

5th. In February and March of the present year, I sowed 1500 lbs. of Peruvian guano on nine acres and 17 perches of land, throwing it on the hard ground. I then threw the land up into four feet beds with a two horse plough. About one-half of these beds had a two horse harrow run over them. About the middle of April I split the beds with a single horse plough and dropped the corn two feet apart in the furrow, covering it with a two horse harrow. The corn came up beautifully and stood well. When about half leg high, and when the land began to be very grassy, I threw the dirt from the corn with a single horse plough, and followed with the hoe as rapidly as possible, cutting away the grass and weeds and pulling the dirt around the corn where it had been left too naked by the plough. Ten days after, I threw the dirt back to the corn with the same plough, running but one furrow and leaving the beds as flat as I could. About six days after this, and with the same plough, I broke the middles out entirely finishing the whole process before the 20th of June. After harvest, I ran over it with the hoes, chopping away the bunches of grass and weeds where they occurred and pulling off the suckers, of which there were not a few. At the first working of the corn it was thinned out to one stalk, except occasionally where the growing plants looked unusually vigorous, in which case two stalks were left in a hill. The nine acres and 17 perches yielded ninety barrels of corn, a specimen of which I have brought with me for exhibition. The cost of the

* Sent to the Committee on Branch II.

guano was $43 32 per ton of 2000 lbs. or $3 59 per acre. The quantity per acre 166 lbs. Eight acres of this land in 1847, the year that I bought it, yielded seven barrels of corn, less than a barrel to the acre. It has since been thrice dressed with guano for wheat, and about one-half of it has been limed. I gave for it $6 33 per acre. The following figures show the profits per acre, after deducting the cost of the land, the cost of the guano, and the costs of cultivation:

10 barrels of corn, at $3 per bbl.,		$30 00
Fodder, shucks and stalks,		5 00
		$35 00
Cost of land,	$6 33	
Cost of guano,	3 59	
Cost of cultivation,	5 00	
		14 92
Balance after paying for land, guano and cultivation,		$20 08

THOMAS JONES, JR.

Richmond county.

Specification No. 10.

Experiments with Tide Marsh Mud as Manure.

The formation known as marsh mud is very abundant on all the rivers in the tide water region, but as the scope of the inquiry embraced in the 10th article of the list of subjects for experimental reports, seems to refer to all the various formations, the base of which is vegetable matter in combination with mud or alluvium, it may not be irrelevant for me to premise that alluvial matter, suitable to be carted out on the land or to be mixed in farm pens with lime, abounds throughout all the Southern Atlantic States. The deposits from the great rivers which penetrate far inland are uniformly found to be richer than on the short streams which have their source in a lower or more sandy region. There are, however, formations to be found in every part of our tide water region, where the deposit is of a local character and in many places of considerable depth, which are of much value to the farmer. The deposits from our rivers are of immense extent, but rarely available for agricultural purposes. The regular visits of the tide and the extreme lowness of the formation making them inaccessible with carts to be profitably resorted to, except in certain very favorable places. Wherever marsh mud is situated so as to permit it to be drained, there can be little difficulty either in obtaining it or in ascertaining its fertilizing properties. The farmer in search of rich alluvium, available to be carted out, will in our tide water region find it usually where the deposit of leaves and rubbish and the rotting down of grass has filled up bottoms at the heads of coves and small valleys. There the running water brings down every thing it can carry with it, gradually filling up the low level, until the accumulation of sediment and grass, in alternate layers, forms something like a natural compost. Of peat proper there is none in Eastern Virginia—that formation belongs to a cooler and more moist climate than ours. Spongy formations, made up of the roots of marsh grass, are sufficiently common in the extensive salt and fresh marshes which are found at various points on the shores of our broad rivers. I have found the fibrous roots more unmanageable than the rotted matter lying below them, and less fertile. The intelligent farmer can have little difficulty in distinguishing a formation which is rich in itself from one which is to be used merely as a base to be operated on by other agents. A detail of my experiments in the use of marsh mud, so called, at my farm of Eagle Point, in Gloucester county, will best explain my views. The land in question lies on Severn river, a salt water stream which bounds on two sides of the farm. I bought it twenty-three years ago, finding it, in common with all the country then, miserably worn down. This tract is so flat and low that I soon found it necessary to sink my ditches in many places to the level of low water. In doing so I had to cut through marsh formations which lie at various places around my shore, and my attention was early directed to the value of the material as a fertilizing agent which I threw out of my ditches. Fifteen years ago I began regularly to widen and deepen my ditches, and having carted the mud from the outlets, where I cut through the marsh, back on the most convenient parts of my field, found such encouragement that I soon began to extend my operations; this I have continued to do ever since. The marsh mud in question is found usually covered with salt or fresh water grass according to its proximity to the salt water or otherwise. Generally there is a tough mat of roots for the first spade in depth, and below that a soft formation, evidently made up of rotted roots and leaves with the washings down of the soil from the land above. The depth of this formation varies much, as it is evidently an encroachment on the old level. In many places I expose logs covered by the marsh mud and lying, perhaps, on a bed of sand; elsewhere I am stopped by the tide water, which fills the cut before I can get through a deeper bed of the mud. This formation I find common on the rivers in this region, but varying much in its fertility; deriving as it does, its chief richness from the adjacent lands, it partakes of the character of the contiguous soil or that from which it receives its deposit. In procuring the mud, I have found it necessary to adapt my management rather to the peculiar circumstances of the farm or the command of labor I might have at the time, than to any preference I might have for the mud in a dry or frosted state, over the fresh condition. It is well to throw out a large quantity ahead and then to cart it on the land in a dry and pulverized condition, yet I think that there is little difference in the economy of the operation whether the mud is carted on the land fresh or dry, it being more important to find full work for the hands and team at a leisure time than to cart the mud dry, and when the loading the carts for short distances and spading up the mud makes one operation it more than counterbalances the additional weight occasioned by the water, besides that in many cases the salt water is in itself no disadvantage. I have frequently occupied my hands in spading in the salt marsh in winter advantageously, which does not freeze as readily as fresh water marshes do, and have been able to work comfortably when in other places the ground would be too hard frozen to be penetrated at all by the spade.

The mixing of marl or lime in compost with marsh mud will be found to improve both, and on a small scale would be beneficial, but in going over a large surface the double hauling will be found to be a serious objection. I early observed an efflorescence on the mud and marl produced by the combination which was evidently a carbonate of soda mild and fertilizing. I have been led to apply the mud freely to land which has been over-marled with excellent results. These experiments, so called, have ceased to be experiments with me, and rather belong to a permanent part of my system of improvement, having regularly applied more or less of

the above described mud to my fields for the last fifteen years, and varying according to the convenience of the fields, I happened to cultivate, to the deposits, but have averaged not less than fifteen acres a year during the last twelve years. The quantity applied has varied with the strength of the mud and the distance I had to cart it, the number of cart loads, being one horse or mule tumbril loads, averaging about fifty to the acre. In conclusion, I would remark that while the application of marsh mud is laborious when used as a means of extensive improvement, it will be found in many cases to be profitable. When nature has denied to a region otherwise favored the better qualities of soil, every thing must be turned to account which can be used as a fertilizer. In my case the mud originally encumbered the banks of my ditches; after removing that, I was induced to go farther, and have now gone over some two hundred and twenty acres, besides what has been used in the summer farm pens which tells admirably. The rough sod being most beneficially trodden by the cattle and saturated with their manure at periods when it is difficult to find any thing else to place in them. Wheat and corn are alike benefitted by salt mud; corn stands dry weather remarkably after the application, and the weight of the ear and size of stalk alike show the good effect.

I would remark that in reviewing the experience I have had in the use of marsh mud, I find myself unable to state more accurately than I have done what would be the proper quantity to apply to the acre, the substance varying as it does so much in strength or fertilizing properties, and being so heavy that the farmer is interested in applying as little as will do when he has any considerable distance to haul it, besides marsh mud ranking as it does in a low scale with the substances which produce any decided change or impression on soils, is only suitable to be used on a large scale by farmers who may happen to have a strong force. Under the stimulus of high prices the English farmer has hauled sea sand a considerable distance to improve his land; when marsh mud has to be removed only a short distance, it must happen in numberless cases that it will be found most valuable used either in compost or placed upon the land in its raw or natural state. I have found marsh mud more beneficial than ordinary farm pen manure, and more lasting in its effects on my crops, and when found as is often the case convenient to poor point land which can be limed, or marled, but not manured without hauling a great distance, its value will be fully appreciated by any farmer who will make a fair trial of its improving properties.

JOHN R. BRYAN.

Eagle Point, Gloucester County, Va.

Specification No. 12.

Experiments with Sulphate of Barytes as a Manure.

Barytes as found in its native state, is either a sulphate, or carbonate, and is sometimes called "Heavy Spar." In various localities in the counties of Rockbridge and Bottetourt, as well as on Cedar Creek in the counties of Shenandoah and Frederick, it appears in the former shape, or, as a Sulphate of Barytes. One, the Carbonate of Barytes, has been considered a virulent poison—the other, the Sulphate, was only remarkable for its *ponderosity*, the specific gravity (being nearly double that of gypsum) until this property attracted the attention of the manufacturers of white lead, and it is believed to be used to a considerable extent by them, in adulterating that article. And it is probable we are indebted chiefly to the search of one of their agents, for the knowledge we now have of its value as a fertilizer. For it was this which called the attention of an enterprising farmer on Broad Creek, the late John Ackerly, to it, and induced him to have a wagon load ground, and sowed as plaster, under the impression it was really a native gypsum. And I was informed by him, that its good effects on the clover on which it was sown, were as manifest as where the Nova Scotia plaster had been sown alongside. Though an illiterate man, he was observant, and indeed possessed more acumen than usual, and his experiment was made under the mistaken belief it was a native gypsum, for he was totally ignorant of the difference between a Sulphate of Lime, and a Sulphate of Barytes. The result, however, satisfied me it was worthy of further investigation; and as we were ignorant of the affinities which governed the action of the Sulphate of Lime, it might be, that the Sulph. of Barytes (which I knew this to be) would be equally efficacious. With this impression, I had a wagon load dug from the road side on Elliott's Hill, within a mile of me, and after passing it through my corn crusher, ground as plaster—the whole being accomplished with abont the same labor attendant on the crushing and grinding of gypsum. This was carefully sown in separate rows or strips, about fifty feet apart, on a field of oats and clover, in the spring of 1849. In consequence of unforeseen delays, this was not sown until the first of May, when the oats were several inches high. The ground being a high knoll of lime and soap stone, and the season unusually dry, the oat crop was a short one, and I was disappointed in finding no perceptible improvement in my oats on the strips sown. After harvest, however, the weather became showery, and as soon as my stock had tramped down the stubble, these became visible, and there was a decided and marked superiority in the clover in the rows where the Barytes was applied. Here was at once a pleasing and most decisive evidence of the value of the article; and recollecting its insolubility—being greater even than that of the Sulph. of Lime, I could without difficulty account for its want of action on the oat crop—rain and moisture being essential, and necessary to produce those affinities and chemical combinations which science has not, as yet, fully and satisfactorily explained. To the mere farmer, the *result* was most gratifying, and this determined me to withdraw this field from its regular rotation, and devote it entirely to the experiment; and though it is now approaching five years since the Barytes was applied, there is no sensible diminution in the strongly marked verdure of those strips. In my letter to the Editor of the Southern Planter, published in the November number for 1851, of that invaluable agricultural Journal, page 325, to which I would also refer for the remarks of Mr. Ruffin and Professor Rogers, I say "I can distinguish the deep green strips where the Barytes was sown, near a mile distant, almost as plainly as the *pen-marks* on the paper on which I write." However strong this language may seem to be, there is no exaggeration, and it is *equally applicable now*, after a lapse of near five years. In the above letter, I mention the luxuriant growth of white clover; and this has now yielded to a grass indicating a still higher grade of fertility. I mean the *green sward*, or English blue grass, as some call it,—not the genuine blue grass growing on a poorer soil, and a great pest in the wheat or corn crop. In the fifty feet spaces between these strips, there is at this time a thick growth of the fall, or crab grass, which, not being able to get through the compact mat or

sod of the green sward, contrasts curiously with it—the latter in bloom presenting a reddish hue. Having omitted to mention it in my letter to Mr. Ruffin, I will here state, that after my hands had sown the strips up and down the hill, and one across horizontally—I had the bags which had been used, shaken parallel to the latter, and the good effects of even this small quantity, *are still manifest*, and *very striking!* It may be well enough, also, to state that a few other strips were sown on a different aspect of a hill, though on a similar soil, with the same decided benefit.

Elsewhere I have referred to the experiments of the Rev. George D. Armstrong, made at the same time of my own. He was then the able Professor of Chemistry and Natural Philosophy in Washington College, and his use of the Baryta, was necessarily on a smaller scale. I feel, however, authorized to refer to them, as being decidedly beneficial on his garden vegetables, and also on a small lot of clover. In further proof of its efficacy, I would also refer to the experiments of William Paxton, Esq., residing on James river, in this county, on a free or sand stone land, on which the clover was as much benefitted, apparently, as if gypsum had been used. But in a conversation which I have just had with Daniel Crigler, who lived with me whilst I was conducting my experiment, but now lives near Elliott's Hill, I am informed, that in planting his corn, he dropped the ground Barytes and ashes, on several rows, "in the hill," and on the adjoining rows omitted to drop any thing; but next to the omitted rows, he dropped plaster and ashes, as is very customary here. And the result of this experiment, which does him great credit, was, that whilst the plaster and ashes produced its usually good effects, there was a *remarkable superiority* in the rows on which the Barytes was applied, and the intermediate "omitted" rows, presented a puny and yellow appearance. This application of Mr. Crigler's was on an exhausted limestone land, and is interesting, as proving (what I did not doubt myself) the great value of this mineral on *corn*, as well as clover. In addition, I may say, that a son of Mr. Saville, of the same neighborhood, was induced to try the Barytes, on a row of peas in the garden, which resulted in like good effects. The Baryta used by them, as well as myself, was procured on Elliott's Hill, and I am sustained in pronouncing it a pure *Sulphate*, both by Professor Rogers and Major Gilham, the accomplished Professor of Chemistry in the Virginia Military Institute.

From the above it is incontrovertible, that in the Sulphate of Barytes, instead of a worse than useless article, we have found a most valuable fertilizer, and while we leave the modus operandi, to further scientific research, we may rejoice that such an addition has been made to the means of recuperating and improving our lands.

Since writing the foregoing, I have received from Major Gilham, the subjoined very interesting letter in reply to some inquiries made of him, in connection with this subject. Knowing his readiness at all times to contribute to the cause of agriculture, or to aid in any scientific research, I shall take the liberty to copy his letter entire, with the exception of a single paragraph, not immediately relevant.

VIRGINIA MILITARY INSTITUTE,
Lexington, Oct. 19, 1853.

My Dear Sir,—Yours of the 10th instant, accompanying two samples of minerals, supposed to be Sulphate of Baryta, was received in due time, and in accordance with your request, I have examined both specimens. The sample from "Elliott's Hill," which you say is some of the same that you have been experimenting with so successfully, is pure crystalized Sulphate of Baryta; the other, from "Short's Quarry," is nothing more than a peculiar form of limestone, which most probably contains more or less magnesia, together with a very small quantity of phosphoric acid.

Some years since Professor Armstrong made an experiment with Sulphate of Baryta upon a clover lot, using it in alternate strips with plaster. I saw the clover, which was very fine, and could see no difference between those portions treated with plaster and those to which the baryta had been applied. This experiment I did not regard, however, as perfectly satisfactory, for no spaces had been left where neither plaster nor sulphate of baryta had been applied, and hence one could not be certain that either had been beneficial. Some two years ago I learned that you had used sulphate of baryta upon clover, and that you had applied it in such a way that, if beneficial, the benefit must be apparent. Feeling interested in the matter, I visited your farm, and became convinced from seeing the field upon which you had used the mineral, that for clover, or permanent pasture, a better manure could not be desired. My visit occurred, you informed me, something like three years after the application, and at that time the cross lines along which the sulphate of baryta had been strown, were as distinct almost as the lines on this paper. This was in the latter part of November or early in December, and at that time the strips upon which the baryta was sowed, were well set with blue grass, affording excellent pasture, while on the remaining portions of the field the grass was almost entirely dried up. To my mind, nothing could be more satisfactory than your experiment.

* * * * * * * * *

Your experiment not only establishes the fact that the sulphate of baryta may be used as a substitute for plaster upon clover and permanent pasture, but you have also proved it to be more lasting in its effects.

When I saw your pasture the barytes had been applied for three years you informed me, and still the effects were visible as far as the pasture could be seen, and I understand that, even now, the manured strips are quite as conspicuous as at that time. The fertilizing power of sulphate of baryta must, of course, be due alone to the sulphuric acid which it contains, and this would lead to the conclusion that, in very many instances, the effects of plaster upon the grasses are due to the acid of the plaster, rather than to the lime. The greater permanence in the effects of the sulphate of baryta over plaster is due, I conceive, to the insolubility of the former, and to the difficulty with which it is decomposed by chemical agents. Chemists have no solvent for it, and to decompose it they are obliged to resort to the use of the alkilies, and a strong heat. Your experiment proves that the agencies at work in the soil, are sufficient in time, and at common temperatures, to effect those changes in the mineral, which the chemist can only produce by the aid of his furnace.

It may not be amiss to state that, in consequence of the "equivalent" of baryta being much higher than that of lime, an application of 100 pounds of plaster will supply as much sulphuric acid as 132 pounds of sulphate of baryta.

Respectfully, your obedient servant,
WILLIAM GILHAM,
Prof. Chemistry Virginia Military Institute.
DR. R. R. BARTON.

I need not say a word in commendation of this letter. The Committee on "Essays and Experiments," will fully appreciate its value. I will only

add that, though this mineral is not found, as yet, in very extensive beds, except on Catawba, in Botetourt, it is believed to exist throughout our limestone valley; and, as Mr. Ruffin states in the Planter, page 324, that it is found in Fauquier, Greene and Albemarle, and I know it is in Bedford, it is probable, as he states, that it does exist "in the whole tier of Piedmont counties." To those disposed to try its virtues, I would say, have it ground *fine*, as gypsum should always be, and as it is not volatile, like barnyard manure, and more insoluble than plaster, apply it early, and probably January and February would be the most favorable months for its application.

All of which is respectfully submitted to the Committee on "Essays and Experiments," by

ROB. R. BARTON, M. D.

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BRANCH II.

Specification No. 1.

ESSAYS OR WRITTEN COMMUNICATIONS.

Essay on Enriching and Improving Worn-Out Lands.

It may appear preposterous and even ridiculous in the eyes of some, for a *ploughman* of the main, to attempt to enlighten the lords of the manor upon agricultural subjects, and more especially, for a sailor to undertake to instruct the genuine farmer as to what he ought, or ought not to do, for the Renovation of Worn-out Lands in Virginia. Be that as it may, the invitation of the Society upon this branch, as indeed upon every ramification of agricultural knowledge and improvement, is so expansive and liberal, and being so large a beneficiary from the writings of others, I feel called on to contribute all I do know, if of any value, to the general stock of useful knowledge to be diffused through the Agricultural Society of my native State.

To my task, then, and what I may write will partake more of the character of a simple narrative or journal of my own doings than of a treatise derived from the doings of others.

First, I will show what my land was in 1819, when I took it in hand. Secondly, what it is now in 1853. Thirdly, by what means it has been resuscitated and brought to its more than pristine fertility. Fourthly, a system of rotation, for the guidance of *young* farmers of the most limited means,—and lastly, some observations on Lime and Liming;—on Manures and Manuring:—concluding with a formula for compounding various manures and the formation of *cheap* compost.

In the first place, then, January, 1819, found me in possession of land in Fairfax county, Virginia, so poor, as, even in that, then proverbially poor county, (of which it was often said, the more Fairfax land a man owned, the poorer he was,) to be known and designated by the commissioners who divided the old family estate, as *Poor Hill next the Dower*. One-half of my 140 acres was in virgin wood consisting of the varieties common to this section of Virginia. The quality of the land, originally, was middling, and all the cleared portion was thoroughly exhausted by the tobacco and corn system of our progenitors, who in their laudable desire to enrich *posterity* left their children fields poor indeed. This isolated patch drawn from a worn-out tobacco plantation of 3000 acres, was without improvement of any description; there had never been even a negro cabin on any part of it; it was not fenced in; nor was there a wheelbarrow load of manure about the premises; nor was there, at that day, within my reach, any of the powerful, concentrated manures now so freely used.

No agriculturist, young or old, ever embarked on a more forlorn hope than did I, when I undertook to *renovate worn-out soil in Fairfax*. 'Tis true, I had a small income of about $700 per annum from another source, but what was that compared to my wants? I had houses of every description to build, labor to hire, feed and clothe; farm to stock out and out, and my own personal and somewhat extravagant wants real and imaginary to provide for. In short, I had every thing to buy and nothing to sell; and what was worst of all, I was discouraged by old farmers, on every side, some of whom affirmed that Fairfax land could not be improved. "Plaster would not act at all," and *as to clover, it was a greater impoverisher even than corn and oats*, the alternating crops of those times.

The first decisive step I took was to sell forty acres of my wood-land to enable me to erect a house to live in. That left me about 70 acres of thoroughly exhausted, worn-out, *naked and gullied* cleared land, to commence on. The agricultural condition of the neighborhood in which I settled, will be better understood, when I state that in 1820, the whole 3000 acres of which my 140 acres were a part, did not yield three tons of clean hay per annum.

If at the commencement of my agricultural experiments I was discouraged by the example and predictions of those among whom my lot was cast, I assure the reader, the results of the first few years were by no means cheering, but *having put my hand to the plough*, my faith was too strong to allow me to look back in despair, although I did not always reap where I sowed, and frequently gathered not, where I had scattered with a liberal hand. Such was my beginning in 1819. The third year thereafter, I cut a little clover for hay and had one acre of reclaimed swamp land well set in timothy. This year I erected a permanent shelter for cattle with a *loft capable of holding* 35 *or* 40 *tons of hay*. While this building was being erected, it was the laughing-stock of the neighborhood, as well as of the passers-by on the turnpike. The best farmer of the vicinity, at that day, after a careful survey of my premises, *cow house* and *hay mow*, declared, that the whole county of Fairfax would never make hay enough to fill them!! Was not this encouraging to a young farmer? But what is the result? For twenty years past, that mow has not been able to contain one-half of an average crop. Fields which did not produce even poverty grass when I took them in hand, now produce Kentucky blue, i. e. *English lawn grass*, spontaneously,

and those which did not return three bushels for one, when seeded with rye, oats, buckwheat, &c. &c., now yield from fifteen to twenty-seven, and as high as thirty-two bushels of *wheat* per acre, from thirty to as high as seventy-two bushels of *oats* per acre, from eight to fourteen and as high as seventeen barrels of *corn* per acre, and an average of one and a half tons of *cured hay*, and as high as three and a half tons per acre at a single cutting, and all other crops usually cultivated on market farms in like proportions, besides having over six hundred fruit trees in full bearing of the most choice seed and stone varieties.

Having thus shown what my land was when I took it in hand in 1819 and what it *now is in* 1853, and lest any may be incredulous, I will here insert two extracts from Ruffin's Farmers' Register, for the years 1838 and 1839, in proof of the practicability of reclaiming the worn-out lands of Virginia and Maryland, and of raising them to the highest state of productiveness.

EXTRACTS.

"Memorandum of the culture and products of an acre of land in the county of Fairfax, by Thos. Ap C. Jones, for seven consecutive years, taken from the 1st and 2d pages of Volume VI, Ruffin's Farmers' Register.

In 1831, produced 600 bushels of turnips at 25 cents per bushel,	$150 00
In 1832, Oats 72¾ bushels, sold at 45 cts.	32 72
Stubble turned in and sowed with wheat and clover seed in September.	
In 1833, Wheat (lodged and did not fill well,) only 19 bushels, sold at $1 25 per bushel, -	23 75
In October mowed the stubble and got one and a half tons of cow food, worth $12,	12 00
In 1834, Clover, June cutting, 3 tons,	36 00
September, 1½ tons, at $12,	12 00
Fallowed after second mowing and sowed with wheat, harrowing in *fifty bushels quick lime* at the same time.	
In 1835, Another bad wheat year, (blossoms washed off by hard rains,) only 22 bushels, at $1 25, - -	27 50
Mowed the stubble in September, one and a half tons of mixed hay, worth $12,	12 00
In 1836, Clover and herds grass, 3½ tons, $15 per ton, - -	52 50
Second crop ploughed under, preparatory for corn.	
In 1837, Planted latter part of April, with *Baden's twin corn*, four feet six inches each way; put a good handful of ashes, lime and plaster of Paris combined, in each hill; product over ten barrels, say 10, at $3 50 per barrel, - - -	35 00
	$394 27

The above land received from two to three bushels of gypsum annually put on at various periods, but *never failing to follow the scythe with a good dressing of plaster.* Ground plaster costs from $7 to $9 per ton in Georgetown. Fresh lime, at kilns in Georgetown, in 1834, cost 15 cents per bushel, now 12½ by the quantity. From these data, let the skeptic make any deductions he may think proper, for expense of cultivation, at the highest wages for man and beast, and add interest on all cost and charges, and still there must remain a clear profit but little short of $50 per annum, from rather less than one acre of ground, which, previous to manuring in 1831, was utterly worthless, but is now considered rich. It has on it 30 flourishing young apple trees just getting into bearing, and promises a good crop of wheat seeded the last of October.

"Product of ten acres of land on the Sharon farm in Fairfax county, Virginia, (owned by Thomas Ap C. Jones,) improved by liming and manuring, for the year 1838.

Taken from Ruffin's Farmers' Register, Vol. VII, pages 153, 154 and 155.

Five acres of wheat produced 117 bushels at $1 60, - - - -	$187 20
Straw of the same, - -	28 25
Three acres produced eleven tons, sixteen cwt. of cured clover hay, worth on the farm 50 cents per cwt. -	130 00
Clover seed from the same ground, 2½ bushels, worth now $15 per bushel,	37 50
Rye, and the straw from one-fourth of an acre, - - -	12 00
Three-fourths of an acre in sugar beets, ruta baga, carrots and turnips, and more than one-fifth of an average crop, in consequence of drought, but according to present prices worth $75,	75 00
Fruit and cider sold from peach and apple trees growing on the above land,	251 00
One acre of turnips, gross amount, as per Statement No. 1 (below,) -	255 20
Apples and cider and other fruits consumed at home, and what remains on hand at this time, - -	86 00
Five pigs raised in a pen and fed on grass and offal fruit from the above ground and kitchen slop, killed at ten months old, weighed 734 lbs. at 8 cts. is $58 72; deduct two barrels of corn for last feeding ($8,) - -	50 72
	$1,113 37

One thousand one hundred and thirteen dollars and thirty-seven cents, from which I leave the reader to make his own deduction for the year's expense of cultivation and marketing. This much I affirm that no acre of the above land, except the one in turnips last year, has ever cost $15 to improve it, and that every acre has paid me from $25 to $50 annually since the lime and manure were applied.

I have now a lot, something less than an acre of orchard grass and clover up-land, subsoiled, limed, manured and sown down with rye, or-

chard grass and clover in 1844. It has been twice mowed each year since 1846, and for the last four years, after cutting the orchard grass seed.

The present year the yield of orchard grass seed is 20 bushels, which we sell readily on the farm for $1 50 per bushel. The stubble and clover mowed, as soon as the seed was removed cut one and a half tons of good hay, and on the 5th of October, a ton and a quarter of good cow hay (worth $2) was taken from the same land, and it is now (October 28th) good pasture.

VALUE.

20 bushels grass seed $1 50 per bushel,	$30 00
1½ tons of hay, first cutting, 75 cents per 100 lbs. - - - -	22 50
1¼ tons of hay, second mowing, ($12,)	12 00
	$64 50
Cutting, curing, hauling in, stacking, threshing seed, and $3 worth of fertilizer worked into compost and sown broadcast in the latter part of March,	6 00
Neat profit for 1853, - -	$58 50

These results show what I had done up to 1839.* and what others may likewise do, and in most cases, and in all cases of old settled farmers, in less time and at less expense than I have incurred.

To give a full and circumstantial detail of all the means and appliances employed to produce the results stated, would occupy far more time and space than can be appropriated to an essay designed for the *working* farmer. If I may now claim to be a practical farmer, and a successful renovator of worn-out lands, how I have accomplished this important end, I will endeavor to reveal in the rules I shall recommend for the use of all *young farmers*, who from whatever cause or motive may feel disposed to devote their time and energies to the cultivation of the soil.

I will suppose the young farmer already in possession of the land, and that he is supplied with at least three work horses or mules, one yoke of oxen, one good two horse plough of the barshare kind, and a *one-horse barshare plough*, one *subsoil plough*, one clod and one seed harrow, one two-horse roller, and labor equal at least to two and a half men, besides a woman to cook, milk and wash. I will suppose, too, that he has a comely and *notable* wife, both willing and competent to share with her *lord* and *protector* in all the cares as well as pleasures of life. Also that he has a proper complement of all farming implements, tools, &c., necessary to carry on a farm, among which there must be a two-horse wagon, a horse cart and an *ox cart*. This outfit is computed for a farm of from 120 to 150 acres, according to circumstances. If the young farmer has more land than means to stock it well and cultivate it thoroughly, then my advice is by all means to sell off as much of his surplus land as will put him in possession of funds sufficient to thoroughly cultivate and speedily improve the residue. I have somewhere met with an old proverb which I earnestly commend to all farmers, whether young or old, viz. that "*Two acres of land on top of each other are better than three side by side.*" For example, in 1832 I got from one acre of well manured land, 72¾ bushels of oats, having sowed three bushels. The same year I rented an adjoining field of 23 acres, which had been in corn, the previous year. On that field I sowed 30 bushels of oats, and after giving the landlord his *third*, and taking out the seed, I had 120 bushels left for my profit—rather less; for upon each of the 23 acres there was the same labor bestowed, as upon the *one*—the manuring and eight dollars' worth of time, about the value of *two acres of land* at that time, made the difference.

As my purpose is to lay down rules for the *young farmer of minimum means*, which the affluent and more experienced agriculturist may easily extend or modify to meet their own enlarged ability and circumstances, I shall take for illustration an even hundred acres; thirty of which, we will suppose to be in wood, leaving 70 acres for the plough. Of this 70, I will appropriate 10 acres to buildings, gardens and orchards, hence I have 60 left for farming purposes proper. I will divide these into 6 fields of 10 acres each, and number them 1, 2, 3, 4, 5 and 6. I will suppose, too, that the young farmer is in possession and prepared to break ground at the opening of spring; of course he has employed all the working weather of the winter months of the year, i. e. January, February and March, in getting rails and repairing fences, &c. &c. until the ground was sufficiently dry for ploughing for corn, or, if any portion of his land was in summer crops the previous year, for *oats*.

When the corn ground is to be broken for the first time, which I will suppose to be in nothing better than *poverty grass*, I would hitch the best one of my three horses to the one-horse barshare plough, and *turn the furrow three or four inches only*, following at the same time, and in the same track, with the substratum, alias, subsoil plough, drawn by the other *two* horses, as deep as they can pull it, which if it be Davis' (formerly of Georgetown, D. C.) primitive substratum plough, with my improved point,* will be from eight to twelve inches. This operation at once provides a tilth of twelve inches on an average, still retaining near the surface, where it should be, the little vegetable mould, as food for plants, while at the same time a *receptacle is furnished, sufficient in most cases, to absorb and hold all the rain that falls at any one time,*

* Up to this time (1839) I had depended almost entirely upon the resources of the farm for manuring. With the exception of lime and plaster, my use of foreign or purchased manures had been confined to experiments upon the smallest scale.

* My improvement consists in substituting a steel point, or shoe, in the place of the *circular double bevelled cast iron self-sharpening plate of about seven inches diameter*, with which the lower end of *curved coulter* was armed as a *rooter* to loosen and *raise* the subsoil.

and thus more effectually than by any other device within reach of the farmer of limited means, arrest washing, to which cause is to be attributed, the exhausted state of the once fertile, but now worn-out lands of Maryland and Virginia. The cause of exhaustion once removed the work of renovation becomes progressive; slow, it may be, if unaided by art and science, but time alone, in the end would bring back the land to its primeval state, if surface washing were effectually arrested. Nor is the safeguard against washing the only benefit derived from subsoiling exhausted lands, especially if the substratum be a compact, tenacious clay, (like my own,) for as clay soils are more retentive of moisture, and part with it much slower than gravelly or sandy loams, it follows, of course, that the greater the quantity of rain absorbed by the earth loosened to a great depth, the more there is kept in store, and slowly given out, to nourish the growing crops. On land thus treated I have never known the corn crop to fall below an average one; and when the land has been limed, and when manures have been judiciously applied I have cut as heavy grass from *hill tops* as from *bottom lands*.

Supposing the ground to have been broken as directed, and left in the rough state, till the time of planting approaches, which is better indicated by *nature* than by the *almanac*, or than any man's notion of a particular day; for if you plant too soon, that is, before the ground is warm enough to sprout the seed quickly, you will, assuredly, have much replanting to do, which is sometimes attended with more labor and expense than the first planting. If you plant too late, the culture of your corn will interfere with your clover and grain harvests, and your corn may be injured by early frosts; so that, as in most other acts of man, a middle course is best for planting. In this and like matters, we may profitably follow nature's laws. I have found the budding and blossoming of forest trees a good criterion for planting corn, and sometimes some seeds—for instance, when the leaf of the tulip, or wild poplar tree is the size of half a dollar, Indian corn may be safely planted; and when the chestnut blossoms are fading, buckwheat may be sown with a fair prospect of a crop.

As short a time as practicable before planting corn, the corn-ground should be rolled and thoroughly harrowed, and then marked off with a double mould-board plough, or what is better, the old Dutch plough, long used in Virginia and some parts of Maryland for that purpose, at such distances as may be determined, according to soil, situation and climate. I plant as close as I can, to allow room for after-culture. The poorer the land, the closer I plant, regulating the number of stalks to the acre, by the number left in the hill, rather than by the distance between the hills of checkered, or the rows of stepped or drilled corn. Twelve hours at least, before you intend to commence planting your corn, dissolve half a pound of copperas in some boiling water, into which pour about a gill of tar, add as much more water as will make thirty gallons, then put your seed-corn in: stir it well and allow it to soak twelve hours, at least. When ready for planting, take the corn out, and let it drain a while; then roll it in Plaster of Paris, and put four or five grains in a hill. It will not be long coming up, nor much troubled by crows and the like, and will seldom require re-planting. The next process, if your land was not subsoiled when broken up, is, to run a naked, sharp coulter as near the corn on each side as a horse can walk, and as deep as he can draw it. This done, as soon as your first planting is large enough to thin, run your two horse heavy harrow over it, following at the same time with hand *hoers* to thin and draw a little earth about the remaining plants: without any other cultivation than this, excepting a good handfull of plaster, wood ashes and lime, applied on the hill after covering, I have made eleven barrels of corn to the acre from several acres. As a general rule with me, the culture of Indian corn after it is planted, consists in *surface* culture, taking care never to disturb the sod if any was turned under, and above all, never stir even the surface of corn ground when wet. A good general rule, alike indispensable to preserve the fertility of the land and to insure good crops, is *not to work corn unless the dust will follow the plough*, nor after the roots have extended so far as to be disturbed by the implement. Strict adherence to these rules for the cultivation of all summer crops, will not only insure fair crops, in *any season*, but will redeem that most valuable of all grain, Indian corn, from the unjust charge, so pertinaciously insisted on by all *bad* farmers, of *robbing mother earth of her native fertility and rendering her powerless to produce*.

The young farmer will probably find it necessary to secure all the corn fodder he can the first two or three years. If so, that is best done by cutting the tops and pulling the blades as soon as the outside shucks of the ear turn brown; but corn intended for bread should not be cut off nor gathered before November, after some black frosts; nor even then, unless the cobs are dry. Thus ends the culture for the first year's corn crop, which, be it remembered, was on field No. 1. As early in the spring of the second year as practicable, the cornfield of the previous year is to be thoroughly ploughed, harrowed and sowed down in oats, when immediately thereafter, Field No. 2 is to be taken in hand and treated in all respects as was Field No. 1. As soon as the oat crop is removed from No. 1, turn down the stubble, this time with the two-horse plough, followed in the same furrows by a coulter drawn by one horse, if you have no more. Roll and harrow pretty much as directed in preparing the corn ground, and in the last days of September, or first ten days of October, sow down with wheat—if to be sown broad-cast, soak the seed in *strong brine*, from 12 to 24 hours, and roll in lime. If to be drilled, which is preferable, the seed must be made *dry* by lime and plaster, and then farmed. Clover seed may be sown on the wheat after harrowing, but before

any rain falls, or any time in spring after the snow is gone, and until April.

We are now in the third year, with Field No. 1. As soon as the wheat is removed, turn your swine in as gleaners, but no other stock, until there has been a biting frost, when moderate grazing with cattle will be rather beneficial than otherwise. As the most trying ordeal through which young clover has to pass, on thin lands particularly, is the sudden transition from shade to a parching July sun, by the cutting of grain on which it is sown, it is of the first importance towards guarding against the destruction, in a few hours, of a good *set* of young clover, that it should receive a generous dressing of Plaster of Paris the same evening or following morning. One bushel per acre without any admixture, but finely ground, is the least quantity that ought to be applied at that critical season.

Early in the spring of the fourth year, that is, as soon as the frost is out of the ground, and the clover and meadow-grass leaves begin to expand, dress with a compost of one bushel of plaster of Paris, two bushels of wood ashes, one peck of common salt per acre—double the quantity of ashes would be better, (if ashes are scarce, any rich earth or fine manure that can be conveniently sown by hand will answer, in equal proportions with ashes,) but bear it in mind that after the ground is once covered with snow, no hoof or tooth ought to be admitted on young clover, especially should sheep and horses be kept off, for the buds that are nipped by them in winter and early spring can never recover from it, and many will be *entirely destroyed.*

Clover fields treated as I have directed, will be in full bloom by the middle of June. When one-third of the blossoms have turned brown, is the proper time to put in the *scythe*, and this must not be neglected on any account, for although there may not be a remunerating crop for *hay* to take off the land, it should be mowed and *mowed all over, too*, as there is no better extirpator of noxious weeds, brambles and the like than the scythe, in May, June, July and August. Moreover, if the clover is thin and light, mowing before the root is exhausted by the ripening of the first crop, will cause the roots to throw out many additional seed stalks for the second growth, which although it may not be so tall as the first, will certainly be much thicker, and cover the ground better; [*here remember, whenever you mow over dry land, follow the scythe with a dressing of plaster, if nothing else*]. The second growth of clover is the seed crop, but if the young farmer cannot save the seed without cutting the clover, he had better let it fall and lie on the ground, keeping all stock off until vegetation is checked by autumnal frosts—then, but not till then, it may be pastured without detriment, except when the ground is very wet and soft, and as in the previous year, not after mid-winter. This brings us to the fifth year, with a fair prospect of a tolerable crop of clover, if my directions for last year were strictly adhered to. The young farmer may now exercise some discretion; he may mow for hay in June, or he may pasture off, taking care not to turn in stock any sooner than he would have *finished mowing*. Thenceforth, until April of the sixth year, he has a pasture for cattle, horses and sheep, and the more of them he puts on it and the closer he grazes this year, the better for the land. It is the practice of many good farmers to break up their land for corn, the preceding autumn—my experience teaches me differently. I have always found that *blue* grass, turned over in autumn was not killed by frost, and gave a *deal* of cross-ploughing and other work in spring, to get the ground in good order for planting, and a great deal more work in after culture, than when the sod is turned as short a time as possible before planting: besides this, you lose your best pasture, for sheep in particular, from early frost in autumn till March —say four months in every year on an average. But whether you break up in spring or autumn, No. 1 must go in corn the sixth year, and is to be treated thenceforth pretty much as was the first rotation. Fields Nos. 2, 3, 4, 5 and 6, follow No. 1 in annual succession, and as near as may be, under similar treatment.

The reader will probably be surprised that I have said so little, as yet, about manures. The omission *was intentional;* first, because I did not suppose the young farmer had much of that on hand; and secondly, because I am endeavoring to lay down a plan for the renovation of worn-out lands, in the hands of farmers and farmers' sons, who for want of means, or by reason of remoteness from regular supplies, must depend on the resources afforded by their own premises; and lastly, because I have thought that a separate section devoted to manures, would be better than to break the thread of my narrative by recommending this or that manure, or this or that time or place of applying it. Besides, I am quite sure that my young farmer in the first five or six years of his operations, however successful, has hardly been able to rake and scrape together more manure than was necessary for the production of potatoes and other culinary vegetables, on the ten acres set aside in the beginning for buildings, gardens and the orchards, which, I presume, were planted out in the second or third year at farthest, and will, of course, require annual manuring as well as annual cultivation in summer crops, such as potatoes, turnips, sugar beets, ruta baga and the like, for seven years at least for apple, and all the while for peach trees.

The thirty acres of wood-land, set apart for fuel and fencing, ought to be well enclosed for a permanent hog-pasture and for cattle in early spring, and at all seasons when the ground is too soft to turn cattle on cultivated fields. I have not introduced in my rotation summer fallow, as generally understood, for wheat; first, because it is not likely that the young farmer had a clean field for that object, nor suitable manure to enrich one. All the worn-out lands of Maryland and Virginia with which I am acquainted, are more or less infested with blue

grass and garlic to a degree forbidding the production of good merchantable wheat from summer fallowed ground. Wheat upon oat or barley stubble, which was in corn the preceding year, is not only the best remedy against garlic, but is the very best process to insure a full crop of clean wheat on any land.

It must be apparent to every practical farmer that no stiff land—land best adapted to the production of wheat—can be put in proper condition to receive the seed, when deeply ploughed in mid-summer, by once harrowing, even when the roller precedes or follows the harrow; especially if the land has been pastured. Such land at that season can never be easily ploughed, unless so moist as to bake very hard under an August sun, and often to a degree that no harrow can properly pulverize by once or twice passing over it. I know it has been often said, and will be again said, that a rough fallow is the surest lay for a wheat crop; *the clods* are said to serve as protection to the weak plants during winter, and by gradually mouldering away as spring advances, constantly supply fresh covering to roots exposed by the high winds of March blowing away the fine earth which covered them. That such is the operation and effect to some extent, can not be denied; but it is far better to *prevent the evil* than to cure it by such means. Let your oat or barley stubble be well prepared, the finer the better, and put your wheat in, in good season, with Pennock's or any of the many seed drills now largely in use, and my word for it, you will have nothing to fear from winter killing, nor from the blowing away of dry earth from the roots in spring time. How often do we hear the farmer complain that his wheat is too thin, the winter has killed it, the fly destroyed it, will not make half a crop, &c., &c. While these lamentations are going on, one might traverse the field after harvest, by stepping from clod to clod, which at time of seeding were a foot or more in diameter, and through which no germ of seed did or could possibly pass, while the seed from the hand of the sower, falling on such rough ground, rolls off and interlaps with the seed from neighboring clods, and collects so thickly as to stifle and smother all. So that from one cause or another, a portion of the ground is entirely too thickly and another too thinly seeded, while in the aggregate, by reason of missing spaces, nearly one-tenth of the superficies bears no fruitful plants. Is it then at all surprising that some of the finest wheat lands of the Shenandoah valley and of the opposite counties of Maryland yield an average of only about twenty bushels of wheat per acre, whilst occasionally, with better farming, but no better land, forty, fifty or more bushels are produced? If land which yields twenty or twenty-five bushels under the common mal-practice of rough summer fallow, were treated differently and more after the manner I have suggested, fifty or sixty bushels per acre would be more common than twenty or thirty now are.

ON MANURES.

What I have to record under this head I will premise by endeavoring to correct two very prevalent errors in regard to *lime as a manure.*

First, then, lime, practically speaking, is not of itself a manure, yet, at the same time, no soil, other than alluvial, annually flooded, can be certainly fruitful and *permanently productive*, that does not contain a due portion of lime in some form or other, to be absorbed by the rootlets of plants for the perfection of both straw and grain. I have known some curious blunders and much detriment to the progress of liming, by the use of *lime as a manure, in comparison* with strong, putrescent manures; for instance, a shovelful of each was, by a novice put on the hills of alternate rows of corn. The result of such ill-judged experiments need not be told.

Another common error, and one little less fatal to the general use of lime as an auxiliary renovator is that it must be applied in quantities so large as to interdict its use by most farmers who derive support entirely from an exhausted soil. I was a great sufferer under this popular error. When I commenced farming, there were but few, if any, *native* periodicals devoted exclusively to agriculture, and adapted to the wants of our own country; consequently, we had to look abroad for agricultural light, which, when received, was illy adapted to our resources, our climate, or our worn-out lands. The English works with which we were most familiar, told us of liming by the 1, 2, 3, 5, and even 800 bushels per acre! and in Pennsylvania, where liming was first brought into much use in the United States, 40, 60 and 120 bushels per acre were generally administered. I commenced with about 40 bushels per acre, and I have occasionally applied 60, and as much as 80 bushels on one occasion. The result was highly satisfactory in each case, but the expense was entirely beyond the means of most farmers. Long experience and close observation have satisfied me that lime in far smaller quantities than is generally supposed, may be applied in various ways and with great advantage. I have had good results and lasting benefits from the application of as little as 15, and even down to *five* bushels of fresh burned lime per acre, mixed with three or four times its bulk of *road* scrapings, and even of virgin soil dug out of banks on road sides, spread on grass lands in autumn. Lime, thus neutralized by clay or earth, forms a most valuable ingredient for making compost; indeed, a single bushel of lime well mixed with ashes, dry earth and the like, to prepare it for sowing by hand, applied to one acre of wheat and harrowed in with it, on land destitute of lime, will have a very salutary effect in hardening the straw and producing well filled heads.

The mode of applying manures being a subject of such diversity of opinion among the best farmers, I feel some distrust in recording my own experience. Some plough it in as deep as they can, some shovel or harrow in, and some top-dress by spreading it on the surface and particularly on grass lands, and there let it lie. Some do these things in the spring time, some

in winter, and some at seed time, and a *few directly after harvest or mowing.*

The result of my own long experience after a fair trial of *all* the modes practised or recommended, is that most manures should be kept near the surface within the reach of air, light, heat and moisture. There are some exceptions to this general rule—for instance, when rough manure is used in the drill, (the best mode for raising Irish potatoes in the tide water counties of Maryland and Virginia,) it must be buried deep; so, too, when rough manure is applied to corn ground in the spring of the year. This last practice I seldom pursue now-a-days, and for two reasons—first, the difficulty and cost of hauling such a bulky article any considerable distance, in spring time, before the ground has become settled after the alternate freezing and thawing of winter, and the great damage done to roads and fields traversed at such season. Moreover, I do contend, the opinions of many to the contrary notwithstanding, that the rough manure of the farm-yard, of a winter's accumulation, removed in March for the corn field were, it suffered to remain in the yard, occasionally strewing plaster of Paris and sulphate of iron (copperas) over it until more thoroughly decomposed by the genial heat of spring and early summer, although it might lose 50 per cent. in bulk, one load of the thus concentrated manure would be equal, as a fertilizer, to four of the rough mass in which it was found in March. This is a subject of peculiar interest to the owners of large farms, say, of 500 or more acres. Let any one count the cost of manuring ten acres of land for corn, with manure to be hauled 1200 yards from the farm-yard, in the months of March and April, and he will find that he had better sell the extra teams he has to keep for such hauling, and lay out their value in lime and some of the highly concentrated manures, than to continue the old practice.

I shall be asked how I expend or apply my home-made manures. I will tell you in as few words as I can. In the first place, I have, as the reader may remember, a standing farm-yard or cow-pen in which my cattle are penned every night, winter and summer. The pen is surrounded by stalls for the milch cows and work oxen, while the young and dry cattle have shelters under which they retire at will. The centre of the yard is concave, so as to retain all liquids that fall into it, while there is dry ground round and about for the cattle to stand or lie down on. This yard is abundantly littered with straw, cornstalks, &c. from early autumn till late spring. Back of my horse-stables there are receptacles where the horse litter is deposited morning and evening. This last manure is applied exclusively to *top-dressing* mowing grounds in early spring and autumn, *but the best time of all, is as soon after mowing as possible*, although it be under the *withering sun of July*, or August! This idea will, doubtless, startle many practical farmers, all professors of the art and science of farming, as much as it did me when first recommended by an eminently successful English farmer, still living in this county. At first, I thought my friend was quizzing me, but he became so earnest and entreated me so hard to try it, if with one load only, that I consented, and applied it on a piece of fresh mowed timothy meadow, neither high nor low ground, and at the rate of only five cart loads per acre; the result was a heavy second growth equal to half the first crop, and when in August the part so dressed might have been mowed, the *stubble of the undressed portion was not hid by the after growth.* The crop of the succeeding year was 20 per cent. better than on land of the same quality top-dressed in the usual way and time. Travelling in the State of New Hampshire, a year or so afterwards, on a farm where was growing the best timothy I ever saw in New England, I saw wagons in August hauling cured grass from the meadow to the barn, and *returning with manure from the barn to the meadow!* My farm-yard or rough manure is applied chiefly to the potato crop, planting at convenient seasons through the months of March, April and May. The fine manure or scrapings is worked into composts* and applied to corn in the hills, to garden and field crops, such as ruta baga, beets, carrots, &c. &c. and to oat and barley ground, sowed broadcast and harrowed in; to buckwheat and turnips in July, and to rye and wheat at the time of sowing.

Having said thus much about manures of the farm yard, the practical farmer must choose his own time and method of using them, according to the circumstances in which he is placed.

Of all the concentrated natural and chemical manures, now in general use by farmers and gardeners, Peruvian guano is decidedly the favorite. It may not always be so; it ought not to be the case now. That, upon extremely poor lands, incapable of vegetable production without the use of powerful stimulants, 200 lbs. of guano per acre will produce an astounding crop of wheat, &c., cannot be denied; and if clover seed be sown with the fall crop, or on it, in early spring, a fair crop of clover may follow next year, if the season be favorable, and if that clover be well plastered and ploughed down in June, and again ploughed and seeded with rye or wheat in August or September, there will be an improved base to work on, by a regular rotation such as I have already laid down, which must be pursued or the benefits of the guano will be lost, and the land will be in a worse condition than ever; but guano should not be applied the second time to the same land, unless in combination with other fine manures; nor should it ever be applied in its crude state to land that is in good heart, i. e. land that will bring thirty bushels of Indian corn or fifteen bushels of wheat per acre, without it; not but that guano on some such land might increase the product of both wheat and corn enough to pay for itself, but if it should, the soil will be robbed of its fertility, and will be left in a far worse condition than when the guano was first applied, at least such have been my own results

* See Appendix for recipe.

in its use, and such is the universal character of guano in Peru, as I there learned, upon personal inquiry, from the mouths of all persons (with whom I conversed) engaged in gardening and agricultural pursuits around the city of Lima, the capital of Peru, from whence we obtain the best guano. I have frequently been in Peru, first in 1825, again in 1842–3, and more recently in 1848, and on each and every occasion, I took the greatest pains to obtain all possible information as to the value of guano as a manure, and the mode of applying it to field and garden culture, as well as to *its effects upon the land*, and with one accord and without a solitary exception, I was told that land stimulated by the use of guano, soon became utterly worthless, unless the stimulus was kept up by repeated applications. This was the reason assigned for so little use made of guano, where the cost of the article is merely nominal, not exceeding half what we willingly pay for leached ashes in the District of Columbia.

Of all the concentrated manures for sale in our sea-board cities, crushed bone or bone dust is undoubtedly the best; its effect on the soil is both prompt and permanent. At least, a single application made by me fifteen years ago, is still quite visible, although the ground has been heavily cropped ever since. I found that one bushel of crushed bone was equivalent to one double horse cart load of good farm yard manure. Forty such loads is the least that will enrich an acre of worn-out land sufficiently for a good crop of corn; hence at the present price of bone dust, that manure is beyond the means of most farmers for the renovation of poor land.

Poudrette, of the Lodi, New Jersey, works is an excellent manure for forcing vegetables to early maturity, hence its great value to market gardeners in the vicinity of cities, but like guano, it imparts little or no *abiding* fertility to the soil.

Chappell's Fertilizer has opponents as well as friends. Its effect does not appear to have been uniform in the hands of different persons, nor even when applied by the same person at different times—so some say. Such discrepancy, however, is not very marvellous, since we know of no human agency that can by any possibility produce precisely the same results in the product of the soil, every year for a series of years. If this be true, and no practical farmer can gainsay it, ought the Fertilizer, any more than guano or other manures all various in their effects, to be condemned and thrown out of use? The cost of the Fertilizer, ($1.00 per 100 lbs.) is too high for farmers in general, 600 lbs. per acre being necessary to bring very poor land up to a productive state. I am now in my third year's free use of this chemical preparation, with highly satisfactory results in every instance, the cost being the only objection so far with me, but even this is much reduced when the prolonged beneficial effect of this renovator is duly considered and compared with that of guano. The first two years I used the Fertilizer (Chappell's) I put two barrels or 600 lbs. to the acre without admixture, but on account of expense, about a year ago, I commenced a more economical use of it by admixture with cheaper substances, obtained without money, such as rich earth, or fine manures sufficiently pulverized to be conveniently sowed by hand. For proportions see appendix.

Of the Phosphate of Lime, to be purchased in most of the large cities on the sea-board, I have only used Chappell's bi-phosphate of lime, 100 lbs. of which, in combination with other more bulky substances, to be sowed broadcast by hand, and harrowed in with small grain, or sowed in the drill, or dropped in the hill for corn, and all sorts of roots, makes one of the best manures I have ever tried. See appendix.

Plaster of Paris, slacked lime, wood ashes and common salt combined in due proportions, may after all, at the same, or less cost, be more profitable to the farmer than any manure yet known.

Considering *lime* as the only sure foundation of any system of farming which may be adopted for the renovation of lands exhausted by injudicious culture—I will devote a few lines to that particular subject, by stating what I would do, if I had my work to go over again, and which of course, I recommend to all other beginners, in their efforts to improve worn-out lands.

First, then, when your land has been well broken up, for corn *in the spring of the year*, spread on it from 30 to 60 bushels of dry slacked lime. When the farmer is near enough to kilns to get the *fine* lime fresh drawn, and can get it on the land before it slakes, thirty bushels of that sort will be still better than the larger quantity slaked, but be very careful not to let your lime get wet before it is spread and *harrowed* in. If you are so remote from lime kilns as to be able to haul only one load a day, it will be better to buy the fresh burned and best lump lime, because in that state it is much lighter, and when water-slacked, will increase from three to five-fold. Such lime ought to be put under cover and slacked immediately with strong brine. Lime of the quality described and treated accordingly, acts very *promptly*, mechanically as well as chemically; mechanically in reducing stiff, rigid clays to a loose friable texture, and chemically by neutralizing acids unfriendly to vegetable production, and by combining with loose and light soils, they are rendered more adhesive and retentive of moisture; in other words, lime judiciously applied to stiff land renders it light, while it imparts to lands too light, a firmer or more compact texture. This dogma, paradoxical as it may appear to many, is fully established by every brick chimney or stone dwelling in the land. All who build such houses, know that lime and sand, (the latter largely predominating in all light soils,) with water, are the materials used by masons for the formation of mortar, which in a short time becomes as hard, if not harder than the bricks. It is also well known, that if stiff clay or rich mould were to be used with lime for mortar, instead of sand, that when

dry, it would moulder away, and become impalpable dust. Now with these plain truths before us, it is only necessary to apply smaller portions of lime to our lands, varying according to their texture, and we can have stiff or light land as we may choose or will it.

Most writers on lime applied to agriculture, and many practical *liming* farmers, too, recommend a repetition of lime every fourth year in increased doses of 50 or 100 per cent. on the previous dressing, until you get up to 120 bushels per acre at the end of the eighth year. I have not done so, nor do I consider it absolutely necessary, or always expedient at such short intervals. Better extend the time according to my cycle of six shifts, applying the lime to your corn land, in any convenient quantity, not less, however, than you commenced with, say 30, 40, up to 60 bushels per acre. Finally and emphatically, be it remembered, *that if your land is naturally deficient in lime, that deficiency must, in some way or other, be supplied, or you never can reap the full benefits of manuring.* Your crops, particularly wheat, will be uncertain in quality as well as in quantity without lime, however rich your land may be; and in times of drought, your crops of all descriptions may fail entirely, whereas, on judiciously limed land, similar crops under like circumstances will escape almost unscathed.

THOMAS AP C. JONES.

Fairfax county, Va., October, 1853.

APPENDIX.

Combination of Concentrated Manures to be applied by hand.

No. 1.

Soap boiler's ashes 2 bushels, plaster of Paris 1 bushel, common salt 1 bushel—to be sown per acre on all meadows or other grass land in late autumn or early spring.

The proportion of ashes may be increased to any available quantity, say as high as 10 or 12 bushels, which is as much as can be conveniently sowed by hand. When ten bushels of ashes are used, this is a fine dressing to be harrowed in with any fall or spring crop, or as a top-dressing for winter grain; and by reducing the salt to one-fourth of a bushel, and adding one bushel of lime, if your land has not been previously limed, and allow the mass, *after being thoroughly incorporated*, to remain one or more weeks in the heap, you will have a fine compost for corn hills; a small handful to be dropped with corn, potatoes and the like.

No. 2.

Super or bi-phosphate of lime 100 lbs., plaster of Paris 60 lbs., common salt 15 lbs., thoroughly incorporated with two, three, four or five times their bulk of any light, rich earth or scrapings of the lanes and farm-yard after the rough manure has been removed, forms another excellent dressing to be harrowed in with any kind of grain. A small handful dropped in corn or potato hills, and for early spring dressing of meadows, will be found in many cases equal to 200 lbs. of Peruvian guano.

No. 3.

Chappell's Fertilizer 600 lbs. per acre, sowed broadcast and harrowed or shovelled in, *I* have found to be equal for the first, and far better on succeeding crops, than 300 lbs. of Peruvian guano.*

No. 4.

Chappell's Fertilizer 300 lbs., Peruvian guano 50 to 100 lbs. per acre, better than 300 lbs. of Peruvian guano.

Composts to be Spread from the Cart.

No. 5.

Wood ashes 100 bushels, plaster of Paris 10 bushels, fresh slacked lime 10 bushels, common salt 10 bushels. From five to twenty bushels per acre, but never to be ploughed in, and, except on grass land, not less than ten bushels per acre ought to be used.

No. 6.

Rough compost is readily made on a large scale by strewing the valleys on your wood land, where is generally a large deposit of leaves and other vegetable matter with lime, at any season of the year, and at all convenient times after one good rain has fallen. Scrape into winrows, and when you are ready for forming compost, heap alternate layers of this vegetable mould with the rough gatherings about the farm-yard, and with a moderate sprinkling of each layer or so with common salt or strong brine, and a bushel of gypsum for each acre to which the compost is to be applied, makes a good and durable dressing for wheat to be applied during winter and early spring, especially immediately after clover seed had been sown.

THOMAS AP C. JONES.

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Specification No. 6.

Essay on the Properties and Value of the Southern Pea, or "Cornfield Pea."

In submitting the following essay on the varieties of the cornfield Pea, its cultivation, &c., to the favorable judgment of the Virginia State Agricultural Society, I have only to premise that, except in one or two instances, I have treated of those facts alone with which I am experimentally acquainted, or which have come under my own observation.

In treating the subject, I shall consider, 1st, The varieties of the pea, and their comparative value: 2d, The soils best adapted to the growth of the pea: 3d, The best and most profitable mode of cultivating, either as a crop, or as a

* For two years I used Chappell's Fertilizer without admixture—generally two barrels, 600 lbs. per acre. Last autumn I sowed the poorest part of a fresh field with one barrel, or 300 lbs. per acre, *shovelled* in with wheat. The product was equal to 23 bushels per acre, and much the best where the Fertilizer was used. The *weight* per bushel, to say nothing of the increased quantity, was 64 against 61.

subject of rotation in a general system of croping: and 4th, Its properties as an article of food and forage.

The varieties of the cornfield pea are very numerous, and if all the names which could be collected in the country were written, their number would fill several pages, because the same pea in different sections goes by different names. I will mention those which I know and have cultivated, in the order of preference which I would give them, and then refer to those which have been cultivated by others.

1st. The *Shinney Pea.* This I esteem the most valuable variety of the field pea. It is a speckled pea, and may be a cross between the gray or clay pea and the black-eye pea. It is very prolific, yielding on favorable soil, with good seasons, as much as fifty to one. It produces a very heavy crop of vines, as much so as any pea that I know, and for this reason is highly valuable as a fertilizer. It matures early, and continues to bear until frost, and will thus admit of early or late planting. In my latitude, 36 deg. 30 min., I have planted a crop in May, cut off the vines on the 1st of August, when the earliest pods were just full, and then, after frost on the 20th of Oct., gathered a very good crop of peas from the vines which had sprouted from the stubble. The same season I have gathered peas from seed planted on the 1st Aug. The pea is large and heavy, and of a delicate flavor, it is excellent on the table to those who are fond of this vegetable. I have found hogs prefer it to the tory or bass pea, planted in the same field, and they did not touch the latter until they had eaten all of the former. It would I think be an excellent variety as a preparation for a wheat crop. The seed planted in May or June, would make a crop by the end of August or beginning of September, which might be picked or fed off to hogs, and the vines turned in for September sowing. This pea will not, like the tory or bass, and the black pea, bear exposure to the winter. It is on the contrary liable to mould and sprout after prolonged wet, followed by warm weather. It is, however, equally hardy with the gray or clay pea and other varieties of the cornfield pea.

The *Clay* or *Gray Pea*, I would rank next in order. It is, as its name indicates, a gray or light yellow pea; is a good bearer, and yields heavy vines. It is a soft pea, and for this reason is preferred by stock and hogs to the coarser varieties, such as tory pea, &c. It is not so forward as the shinney pea, nor will it bear as late. It is a heavy pea, and from the fact of its being preferred in cities and elsewhere, as food for stock, it is perhaps more generally cultivated than any other variety. It will not bear exposure to prolonged bad weather; it is liable to be stained and turned dark by wet, and for this reason should be picked out as early in the fall as practicable.

The *Red, Tory*, or *Bass Pea*, is another variety, possessing different qualities from either of the foregoing, and also exceedingly valuable. Its distinguishing characteristic is its ability to withstand wet and bad weather. For the late winter feeding of hogs and stock, it is a very valuable crop. It will last through the winter. In part of a field which I had last year in this pea, and which was grazed by hogs and sheep through the winter, (which was both wet and warm) I found in the spring a great many sound peas on the vines and ground, and after the land was ploughed for corn many of them sprouted; as may be supposed from this fact, it is a hard, coarse pea, and stock will not eat it as long as the softer and more delicate kinds last.

It is a good bearer, and yields a very heavy crop of vines. It does not mature early, and for this reason should be planted as early as possible, where seed is an object. It is of a dark chocolate red, and its color is not of course affected by the weather. The crop may be picked out at any time during the winter, and this operation may thus be left until other more pressing and important work is done. The sooner, however, after a frost the crop is gathered the better, as successive rains beat the pods off of the vines, and some of them will mould and rot, or sprout if warm.

The *Black-eye Pea*, another variety, is a good table pea, often cultivated in the corn field. It is, however, a very delicate kind—a small bearer—not producing a great crop of vines, and will not bear exposure to hard weather, every rain staining and injuring the ripe peas. From these facts it always commands a high price in market; but I do not think it deserving a place amongst those peas which may be ranked as fertilizing preparatory crops. It matures early, however, and by September the crop is made. The vine sheds its leaves early, and if the weather be dry and the force large, so as to pick out the crop soon, it might be made a profitable crop as a preparation for wheat, but its profitable culture depends upon so many contingencies that it can never be very generally or largely cultivated.

The *Calivant*, is another variety: it is a small round, white pea, a good bearer, and making a good crop of vines. It is better as a variety for the table, and cannot enter into competition with the three first named varieties.

The *Three Crop Pea*, or as I call it, the *Tribus Pea*, is a small gray pea—very forward, and a good bearer of both pea and vine. I have not had an opportunity of testing its virtues or merits on a large scale. A friend two years ago sent me about a gill of the seed, stating that it would produce three crops in a year—this was in South Carolina. From this quantity of seed, I have raised enough to enable me in the next year to plant an acre, after which I will be better able to speak of its value. If it will mature earlier than the Shinney and yield a heavy crop of vines it will be valuable as a preparation for wheat.

The *Chickasaw*, is another variety of pea, of which I received a small quantity of seed two summers ago. It is a small round greenish pea, not unlike the seed of okra. It is a very prolific bearer, numbering sometimes six or seven pods

on the end of the seed stalk, and continues to blossom and fruit until frost. It matures early, and makes a heavy growth, shooting up in good soil four feet high. It is not a trailing or running vine, and for this reason would be more easily and perfectly turned under by the plough. It is said to be very hardy, and able to resist any degree of cold and wet, and equal in this respect to the Magothy Bay or Eastern Shore Bean: so that when once the land is well set in it, it will continue to grow unless cultivated out; this I have not been able to test, nor am I acquainted with its value as food for stock, although I have heard that it is excellent in this respect, and from the appearance of the pea, I should think it to be so. When the pea is very ripe the pod bursts open, and I should fear from this fact a difficulty in saving seed. I have seen this pea recently exhibited at the agricultural Fair of this State as the *Oregon Pea.* I believe it to be a native of South Carolina, and to derive its true name from the tribe of Indians of that name who occupied a portion of that State.

The *Black Pea,* is another variety, with which I am not experimentally acquainted. Mr. C. and Mr S., my neighbors, have cultivated it, and speak highly of its virtues. It is said to be a good bearer, and to produce a good deal of vine. It is said also to unite in itself the two desirable qualities of being very hardy, and at the same time of delicate flavor, and will thus form a valuable acquisition to those who raise the pea as food for stock. It is also said to mature early, and will thus bear later planting than many other varieties. I have been promised by a friend in Virginia a bushel of this seed, and if its excellencies are all that they are said to be, I shall regard it as a very valuable acquisition to the stock of corn field peas.

The foregoing comprise the varieties of the pea with which the writer is best acquainted, either experimentally or by reputation; and in estimating their comparative values he would certainly give the preference to the shinney pea. Its abundant yield, both of seed and vine, its early maturity and quick growth, entitle it to the first rank in the list of vegetable fertilizers. It will compare favorably with any other variety of pea that I have seen under all circumstances; whether planted as a crop by itself or in the corn field, or sown broadcast as a pea fallow or at the last working of the corn.

The pea, like other vegetable productions, thrives best in certain soils, and will yield a heavier crop on those soils most favorable to its growth than upon others less so; at the same time I believe there is no crop which can be so universally grown, or which will more readily adapt itself to every soil and situation within certain latitudes. It most delights in a warm, sandy soil, not too rich, and the subsoil of yellow sand. On such a soil it will produce quick and heavy crops of both seed and vine. It will do almost equally well on a yellow sand with a clay subsoil, and also on a rich, sandy loam, but in these cases the crop of seed will not be so abundant, although the crop of vines will be very heavy. But in almost any soil where the land is tolerably good, and not deficient in lime, the pea will, if sown or planted with care—with favorable weather—make a good return, and furnish an enriching and improving crop to the land. Peas will not grow well upon land which is not well drained.

The different methods of planting or cultivating the pea are as numerous as the varieties, and each one has his favorite plan, which he considers the best. The writer will give the different methods which he has pursued and some of those pursued by others, and that to which he gives the preference.

The different methods of cultivating the pea may be divided into two heads—planting and sowing—and these heads may again be subdivided into two divisions—planting as a separate crop, and planting in the corn field with corn; second, sowing broadcast as a separate crop, and sowing broadcast in the corn field at the last working or laying by of the corn.

In planting as a separate crop, break up the land, if possible, in winter, and at the time of planting, (which in this latitude is best during the first fifteen days of June,) run off the land in rows 4, 4½ or 5 feet distant, either by running one furrow or listing with three furrows, according to the condition of the land. If it is grassy it should be listed—drop the peas from two to three feet distant in the row, from ten to fifteen peas in a hill, and cover with the hoe, harrow, plough or cultivator with the front hoe removed. After the peas have made two or three of the second leaves, run the bar of the plough as near as possible, throwing the earth from them, as in the first working of corn, and, if necessary, throw out the middle and run over them with the hoe, cutting out the grass and weeds, and again, a little after the vines have commenced to run, plough again, throwing the earth to them. This is all the cultivation necessary, and on good land, with favorable seasons, it will give a good return for the labor spent—say an average of sixteen or twenty bushels to the acre, which, at seventy-five cents per bushel, will equal twelve or fifteen bushels of wheat at one dollar per bushel. This method of planting will take about one peck and a half, or three half pecks, to the acre.

In planting peas in the corn field with corn, the usual plan is to check the corn at the distance of, say 4 by 5 feet, or any other distance which may be preferred, having reference, of course, to the double crop upon the land. The corn at the first working is ploughed in the wide rows, and at the second working through the narrow rows. At this working the plough runs a furrow through the middle of the row between the corn, and hands follow after the plough, dropping the peas in this furrow just between the hills of corn; the plough following or returning covers the peas either with the mould-board or the bar, as the director may prefer. At the next and subsequent workings of the corn the peas get the benefit of the work, and after the fodder is stripped the peas grow off

rapidly, and I have seen them by September cover the land completely. A good crop of peas planted in this way will yield about ten bushels, and sometimes produce a heavy crop of vines. It is, of course, more backward and more uncertain as a crop when planted in this way than when planted as a separate crop, in consequence of the shading of the corn. The quantity necessary to plant an acre in this way with from ten to fifteen in a hill is about one peck to the acre. In planting peas in drilled corn there are many methods, one to plant and cover as in checked corn in the middle, between the rows, three or four feet apart. Of course it is not possible in this way to drop them between the hills of corn. In this method at the next working of the corn the peas are left on a ridge in the middle between the rows. I have seen very good crops made in this way. Another method is just before the second working of the corn to drop the peas between every other hill of corn, and cover with the plough, throwing the earth to the corn. This is an unsafe plan, as if it is dry and the ground hard, the peas are apt to scatter and fail to come up, and those which come up out of the row will be ploughed up in the subsequent workings of the corn. Another method which I have heard recommended by a gentleman from Louisiana, as practised by himself, is, at the last working of the corn to sow the peas thickly as cotton seed in the first furrow run next to the corn on each side of the row; the next furrow covers the peas, and the work is done. This method takes fewer peas than broadcasting, about three pecks to the acre. The peas are left upon the side of the ridge, and are thus more certain to come up; and being planted closely cannot fail to cover the land with a heavy growth of vegetation.

Another method which combines both planting and sowing is to drop the peas, as above described, between every other row, and in the next row to sow broadcast at the last working of the corn.

In sowing peas broadcast in corn the method pursued is very simple. The sower precedes the ploughs, and sows generally at the rate of one bushel to the acre, the ploughs, cultivators or harrows following and covering the peas. Heavy crops of both peas and vines are often made in this way, but the crop is not certain and sometimes altogether fails. The writer has sown as much as two bushels to the acre at the last working of corn, and the year in which it was tried being very dry, the portion of the field thus heavily sowed had the finest growth of peas, but it was in consequence of the drought; one bushel to the acre is, perhaps, the most judicious and economical quantity.

In sowing peas broadcast as a fallow crop in preparation for wheat or other crops, the land should be broken up in the winter deeply, and about the first week in June (in our latitude) the peas sowed at the rate of one bushel or five pecks to the acre, and either harrowed in with a heavy harrow or ploughed in with single ploughs, according to the state of the land. Another plan, and which, under favorable circumstances succeeds admirably, is at any time in the end of May or during the month of June, when by reason of too wet weather, (which sometimes occurs at this season of the year,) the land is too wet to plough the crop of corn, sow peas at the rate of one bushel or five pecks to the acre, and let the ploughs follow, turning under peas, weeds, grass and every thing upon the surface of the land. From the fact of very dry spells occurring with us at this season of the year for the last three years, this method has failed and been, in a great measure, discontinued; for with a full corn crop the ploughs are fully and constantly employed, and cannot be withdrawn from their regular work to put in this crop with proper expedition; and without rain the land is then so hard that a double plough would fail to turn under the growth then upon it, and the cultivater would be rewarded with a crop of crab and fox-tail grass, rather than peas. But when every thing hits, peas sown and ploughed in in this manner make excellent crops.

In estimating the comparative value of the different methods herein treated of, either as a separate or seed crop, or as a rotation preparatory to other crops, the writer is disposed to give a decided preference to the first plan, viz. that of planting as a separate crop. The reasons are obvious; the land is broken up in the winter at a time when the labor can well be bestowed without much interference with the regular work of the farm; the peas can be planted early, or at a selected time, either immediately after planting corn or after the first working; the cultivater is more certain of a crop or stand of peas; by the subsequent cultivation the crop of peas and vines is increased, the crops of weeds and grass destroyed, and the land left clean for the next crop. The two ploughings which the crop requires can be given at times when, by good management, the work can well be spared and its compensating advantages, as partially enumerated, are ample and great. The ease with which the crop can be gathered, when planted in this way, and the greater amount which the hands can pick per day are also important advantages. A hand in the pea field can pick twice as much as in the corn field. If the cultivater is a wheat grower his peas being more forward he can, even after saving seed peas, turn under a heavier and more valuable growth of vegetable matter than where the peas are sown broadcast or planted in corn; or he may run his hogs through the peas before turning under and get a great deal of cheap pork without sensibly lessening the crop of vegetation, as these animals consume only the peas, without destroying the vine. If he is a corn planter or stock raiser he secures in the same way a heavier crop of peas, either for sale or consumption, and his hogs or other stock can derive the full benefit of the crop. In gathering the crop the usual task in the pea field is two bushels to the hand—in the corn field from one bushel to one bushel and a half. Some of my

hands last year picked four or five, and one upwards of six bushels. I paid them per bushel for all picked over their task. This was done in the *pea* field.

The hands are supplied with baskets which they fill with peas in the haulm. As fast as they are filled they empty them upon yards, previously made in any convenient part of the field or headland, by scraping off the surface soil with a hoe. After they have carried enough to make up their task (which they soon learn by experience) they beat them out with short sticks provided for the purpose; they are then fanned, measured, and carted to the house. Another method is to house them in the haulm and afterwards thresh them out at any convenient time. The objections to this plan are, that it takes more house room and hauling, and there is greater difficulty in estimating the work of the hands.

It only remains to consider some of the properties of the pea as an article of food and as a vegetable fertilizer.

As the former the writer regards it as highly valuable. As food for horses it is excellent either ground into meal or used whole; in the latter case, it is best to soak them a few hours before feeding. As food for stock their value is well known, and it is unnecessary here to dilate upon it. As food for hogs there is no crop equal to them. Hogs taken up and allowed to run through a good pea field will take on fat with great rapidity, and need very little corn to bring them into good condition for the slaughterer's knife. The pea pods are greedily eaten by cattle and constitute a wholesome food. As an article of forage or fodder there is none superior to the pea vine. Horses and cattle will eat it with avidity, and in preference to any other kind of fodder. The difficulty of saving these vines has constituted the chief objection to their use. The writer believes that they can easily be saved by cutting them off close to the ground with sharp hoes, in the month of September, and then, having first provided forks and poles, plant the former in the ground in a straight line and place the poles upon them, so that when placed a common sized man can clasp his hands over the pole. Place rails, with one end resting upon the ground the other upon the pole, about six or eight inches apart, after the manner of a top stack or fodder house, as it is called, leaving both ends open, and upon these rails throw the vines until they are about one foot deep, throw over all some straw or grass, and a good supply of the best fodder for milch cows or any other kind of stock will be obtained.

It is scarcely necessary to dwell at any length upon the value of the pea as a fertilizer. Its virtues in this respect are too well known. Experience has fully proved its great value as a preparation for wheat or other small grain, or for corn or cotton.

Its dense shade softens and ameliorates the land; its long roots penetrating to a great depth, brings up from the subsoil fresh supplies of valuable constituents. Its broad leaves deriving their chief sustenance from the atmosphere, first shade, and then by their decay enrich the soil with vegetable matter, and the heavy crop of vines add rich stores of wealth to the soil without any previous great demand upon it. Chemical analysis bears out the knowledge of experience by showing the constituents of the pea to be such as are most needed by wheat and other gramineous crops. Add to this, the quick growth, and the short space of time which it has possession of the land, and we have in it the cheapest and most valuable of all vegetable fertilizers.

I have thus traversed the whole ground necessary to be covered in treating of this crop; and it only remains for me to express the hope that what I have here written may prove beneficial to those needing this species of information, and be the means of inducing those engaged in the cultivation of the earth, and improvement of the soil committed to their trust to try some of the methods of cultivation herein explained.

Respectfully submitted,

P. M. EDMONDSTON.

North Carolina.

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Specification No. 8.

Essay on the Treatment and Management of Milch Cows.

The writer respectfully submits the following essay, on the management and treatment of milch cows, to the Committee on Essays of the Virginia State Agricultural Society, hoping it will not be uninteresting, although it may have no claim to the prize.

I have, for a number of years past, made the dairy the principal business of my farming operation. From personal application, my own labor and experience, I am induced to offer for your consideration the following remarks, based upon the practical system of what I have found for the past ten years, not only a very profitable one, so far as the receipts of the dairy amounts to, but also as a means of improving one of the poorest, worn out farms in Fairfax county. I have for several years soiled my cattle, to a limited extent, keeping my cows in the stable of nights during the summer, feeding green feed night and morning. During the winter our cows are turned out of the stables about one hour each day; in the mean time the stables are then cleaned and well littered with straw. I think our cows are kept more comfortable and healthy in the stables than to expose them a longer time to the changes of the weather during the winter season. In proof of this, I will mention that I have not had a sick cow on my farm for the last fifteen years.

I will now give a description of my mode of feeding during the year. From the 5th to the 10th of May we commence cutting and feeding green rye, night and morning. I mix at first an equal proportion of hay with the rye, and lessen the quantity of hay as the rye gets older. If I am short of hay I mix straw with the rye, pass it through the cutting box, and with the

addition of meal it makes excellent feed, either for cows or working teams. We continue this feed until our orchard grass and clover is fit to cut, which is about the 24th of May. Continue this feed until my broadcast corn is fit to cut, which is from the 20th of June to the 10th of July. I commence cutting as soon as the corn begins to blossom, and continue feeding this, night and morning, until about the first or middle of November. The corn fed late in the fall is more or less injured by frost. However I find it preferable to hay, although hay is often fed with it. From the middle of November we begin feeding turnips with the tops on, just as they are pulled from the field, without cutting, together with the addition of such tops as are taken from the turnips put away for later feeding. We feed corn fodder and hay while feeding turnips, and give slop. The turnips fed twice a day and long feed three times, until we commence feeding green feed in spring. Should our turnips not last until spring we feed our best hay with as much good slop as our cows will drink. If our hay is not of the very best quality we pass it through the straw cutter mixing with it at the same time oats, not threshed. We also use the most of our corn fodder after passing it through Rogers' fodder cutter and grinder. I think it good economy to cut all long feed except the best quality of hay. Our cut feed is made tolerably wet, meal and salt added, and mixed twelve hours before feeding—fed morning and evening. We feed no cut feed or slop without the addition of salt; and also have a trough in the yard supplied with salt, which the cows have access to when turned from the stable. By the use of green feed, fed in the stable during the summer and fall, it will be observed we have considerable carting to do. For this purpose, as well as for cutting feed with the straw cutter, and many other conveniences on the farm, I would highly recommend the practice of working cows, believing, from long experience, that cows will do as much work as steers of the same size, and when well fed and moderately worked will give as much milk as if not worked.

I will now give a statement of my system to produce a sufficient quantity and succession of succulent food through the seasons. My first crop of broadcast corn I commence sowing about the middle of April, (allowing one acre for 20 cows,) sowing at intervals of about two or three weeks up to the middle of July. I broadcast my manure—sow the corn without ploughing, at the rate of three bushels and a half per acre; plough it in about three inches deep, following with a subsoil plough; harrow with a light harrow, and finish with a roller. If the first sown piece of corn gets too ripe, and a later sown piece is large enough to begin feeding, we cut the remainder of the first sown piece with grass knives or a short cradle, leaving it lay on the ground three or four days.

I will here state my mode of keeping broadcast corn in good condition, which is, on fodder houses—leaving the house open at each end for a free circulation of air. I have never succeeded in keeping my broadcast corn good until I pursued this plan. I recommend this feed highly to farmers for milch cows, horses and oxen. The first of my farming in Virginia I commenced sowing corn, finding that poor land would not answer to rely on for a supply of grass during the latter part of summer and fall. I think I am justified in saying that I am, in a great measure, indebted to the present fertility of my farm from the liberal use of broadcast corn. On a farm of less than one hundred acres I have usually sown from eighteen to twenty-five bushels. Summered and wintered on the same farm from forty-five to fifty-five head of cattle and horses, the greater part consisting of milch cows.

I find green rye also a valuable article for spring feed. I sow about the first of September on light, warm land, well manured, for my first crop; for a later sown piece I sow much thicker; and on land that will not bring the crop forward as early in the spring as the first sown piece I prefer orchard grass with clover, both for grazing and soiling, believing it to be one of the most valuable grasses I have, and particularly on land where it is desired to continue long in grass. I cultivate the ruta baga and red top turnip in drills, hoeing the crop once and ploughing twice with the subsoil plough. I believe we may with the same cultivation and manuring produce, on an average, as large crops per acre in Virginia as are usually grown in England.

I will give a brief description of my stable, believing we have conveniences that lessen labor and keep our cows in a more cleanly condition than any stable I have seen.

My stable is 60 by 32 feet—18 cows on one side and 14 on the other, leaving room near the centre of the barn for turnips, meal bin and delivery of running water. The stable on each side is 10 feet, the passage 12 feet, including mangers. Each cow is chained to a staunchion in the centre of the stall, allowing them to feed on either side of the staunchion, with a slop tub in the partition of every other stall, resting on the side of the manger next the stable, which enables two cows to use one tub without disturbing each other, also is not in the way of cleaning the mangers. We have a dirt floor near the manger, then a plank floor two feet wide, making the floor the cows stand on vary in width from four feet to four feet nine inches. I find a variation of six inches in the width of the floor will keep one cow clean, while a smaller sized cow on the same floor would require washing before milking. I have a drain behind the cows one foot wide and one foot deep, leaving a passage sufficiently wide. My system of feeding is to remove every thing from the mangers that is left at a former feed, and the mangers, passage, and all things connected with the arrangement for feeding, should be kept as cleanly as possible.

Fifteen years since, when I came to Virginia, my farm of one hundred acres would not produce hay sufficient to winter two horses and four cows. I have bought very little manure since

that time, and cultivate no more acres, yet am enabled to summer and winter on the same farm over fifty head of cattle and horses.

I must ask the indulgence of the commitee in presenting the above lengthy essay, as I have not had time to present the ideas I wished to express in a more explicit form.

With much respect, I remain,
Very truly, your obedient servant,
LEWIS BAILEY.

Fairfax, November, 1853.

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APPENDIX

To Professor Gilham's Essay on the Analyses of Marls in lower Virginia, &c.

The proportions of ammonia in No. 16, and of phosphoric acid in No. 17, of the list contained in my communication to the Committee of the 15th of February last, being somewhat remarkable and unexpected, I felt it to be proper that I should examine other specimens from the same locality, in order that I might arrive at the mean, or average, fertilizing value of the earths, and ascertain whether the results already communicated in regard to them, were to be relied upon. I accordingly requested Mr. Ruffin to furnish me with a number of samples, taken from different points in the beds. He selected nine samples of the blue clay, No. 16, of my first communication, and twelve of the "olive earth," No. 17. Average samples of each of these earths were made up by taking, for the blue clay, nine equal parts from the nine differen samples of clay, and for the "olive earth" twelve equal parts from the twelve specimens of that earth, and thoroughly mixing the component parts of each. These average samples I have analyzed, and the results of the analyses will be found in the following table:

Number.	LOCALITY.	Carbonate of Lime.	Sulphate of Lime.	Bisulphuret of Iron.	Potassa.	Soda.	Phosphoric Acid.	Alumina and Oxyde of Iron.	Organic Matter and Water.	Ammonia in the Organic Matter.	Additional Sulphate of Lime.
*21	Marlbourne farm	traces	2.117	1.578	0 563	0.238	traces	10.580	7.300	0.080	3.402
22	Marlbourne farm	traces	0.472	0.514	0 233	0 112	0.976	9.350	2.800	0.032	1.387

The following table shows how much of each of the principal fertilizing constituents would be added in a dressing of four hundred bushels of either earth per acre, and also the amounts of these same constituents, that would be added in a dressing of four hundred bushels of these earths mixed in equal proportions. In these calculations I assume a bushel of each earth to weigh ninety pounds, as in the former case.

Number.	Number of bushels.	Sulphate of Lime, in pounds.	Potassa, in pounds.	Soda, in pounds.	Phosphoric Acid in pounds.	Ammonia, in pounds.	Additional Platinum from the Sulphuret of Iron.
21	400	400	200	*	.....	28.8	1180
22	400	100	84	*	350	11	500
21 & 22	200 of each	250	140	*	175†	20	800

These results differ somewhat from those obtained for Nos. 16 and 17, but while they differ, the *general* fact is established that, the blue clay contains more ammonia than any of the other beds, and the olive earth contains far more phosphoric acid than is to be found elsewhere, in any of the marls or their associated earths.

When I penned the Essay submitted to the committee on the 15th of February, I deemed any account of my methods of analysis as unnecessary, but as I wish to present the essay for the "Ruffin Premium," an outline of the course pursued in the analyses may not be out of place.

The organic matter and water were determined in every case, by heating a known weight of the marl or earth, in a weighed platinum basin, until all trace of organic matter was removed; the loss of weight gave the two. It is to be observed that this process is not perfectly exact, in cases where the bisulphuret of iron is present, as the heat necessary to expel the organic matter, also effects a partial decomposition of the bisulphuret; but the error could have no effect upon the practical results.

The carbonic acid was, in all cases except where the proportion was very small, determined by the aid of a "Carbonic acid apparatus," consisting of a very light glass flask of some three ounces capacity, provided with a tightly fitting cork, through which passes a small tube; the tube is attached to a larger one by means of a cork, and in the larger is placed chloride of calcium in small fragments. In the interior of the flask is a small inclined tube. In using the apparatus some 50 or 60 grains of marl are weighed out, and placed, together with a little water, in the flask; the inclined tube is filled with hydrochloric acid, and very carefully let down into the flask, to avoid spilling any of the acid upon the marl; then the cork containing the other tubes, is placed in the mouth of the flask, and the whole very carefully balanced.

The flask is now taken from the balance, and slightly inclined, so as to let a portion of the acid flow from the tube upon the marl; effervescence commences immediately, the carbonic acid escaping through the chloride of calcium, which absorbs any adhering moisture. The operation is repeated until effervescence ceases, and all the acid is poured out of the tube; after standing a short time, the flask is gently heated to expel any remaining carbonic acid, and after standing long enough to cool, it is returned to the balance, and the loss of weight determined. The loss of weight gives the proportion of carbonic acid, from which it is easy to determine the percentage of carbonate of lime.

To determine the sulphuric acid, a weighed portion of the marl or earth, usually about 150 grains, is placed in a capacious basin, an abundance of water added, and heat applied; after digesting for some time it is filtered; more water is added, heated, and filtered, as before, and so the process is continued until the filtrate ceases to become milky on the addition of chloride of barium. Chloride of barium is now added to the filtrate, which is allowed

* Numbered continuously with those of the first communication on the marls.

to stand for twenty-four hours, and then it is filtered; the filter is then dried, heated to redness, and weighed. From the weight of the sulphate of baryta, we are enabled to calculate the proportion of sulphuric acid, and of sulphate of lime.

To ascertain the presence, and determine the amount of phosphoric acid, a known weight, say from 150 to 300 grains, is digested for some time in dilute hydrochloric acid over a water bath. The solution is filtered into a capacious basin, and ammonia added until a precipitate begins to form; then a few drops of acetic acid is added, and an excess of acetate of soda, and heat applied. By this means the phosphoric acid is all thrown down as phosphate of iron, mixed with oxyde of iron. The contents of the basin are now thrown upon a filter, and the filter well washed with hot water; the precipitate is then dissolved in hydrochloric acid, ammonia is added until a precipitate begins to form, and then an excess of hydrosulphuret of ammonia. This throws down the iron as black sulphuret, leaving the phosphoric acid in solution. The sulphuret of iron is separated by filtration, and the solution evaporated until it loses all odor of hydrosulphuric acid, when it is again filtered. To the filtrate ammonia and solution of sulphate of magnesia are added, and after standing for some time, the phosphate of magnesia falls down as a white crystalline powder. By the usual process the quantity of phosphate of magnesia is found, from which the proportion of phosphoric acid follows by simple calculation.

To determine the oxyde of iron, alumina, potassa, soda and bisulphuret of iron, a weighed portion of the marl or earth, generally 150 grains, is digested for a number of hours in dilute hydrochloric acid over a water bath; the iron, alumina, potassa and soda are dissolved, while the bisulphuret of iron is left untouched.* The solution is filtered, and the filter well washed. The contents of the filter are thrown back into the basin, treated with dilute aqua-regia, heated for a few minutes, and filtered. Ammonia in excess is added to the filtrate, which throws down all the iron of the bisulphuret as oxyde of iron. From the proportion of oxyde of iron the proportion of bisulphuret is obtained by calculation. The insoluble residue, after being treated with aqua-regia, may be taken as the insoluble silica.

To the original solution ammonia is added in slight excess, which throws down the iron and alumina mixed. This is filtered, the precipitate dried, heated and weighed.

To the filtrate which flows from the filter containing the oxyde of iron and alumina, chloride of barium, or solution of baryta, is added, which throws down the sulphuric and phosphoric acids. It is filtered, the filtrate heated, carbonate of ammonia added in excess, and again filtered. The filtered solution is evaporated to dryness, and heated to redness. Then it is dissolved in water, filtered, a little hydrochloric acid added, evaporated to dryness, heated to redness, and weighed; the weight is the potassa and soda as chlorides, mixed. The mixed chlorides are dissolved in water, chloride of platinum added, and evaporated nearly to dryness, when the potassa is thrown down as double chloride of platinum and potassium. From this double chloride the potassa, and the chloride of potassium may be found, and the latter being subtracted from the mixed chlorides, gives the amount of chloride of sodium, from which it is easy to get the proportion of soda.

The ammonia, which is of course a constituent of the organic matter is determined upon the same principle that the nitrogen of an organic body is determined; but the apparatus differs somewhat from that in use for organic analysis. About 300 grains of the substance under examination is mixed with caustic potassa in small fragments, and put into a small iron mercury bottle, to which a piece of wrought iron tube is attached; to the extremity of the tube is attached a "nitrogen tube" by means of a perforated cork, and in this tube is placed pure dilute hydrochloric acid. The "bottle" is then placed in a charcoal furnace heated to redness and kept at this heat so long as any gas escapes. The potassa, in connection with the heat, effects the perfect expulsion of all the ammonia, which is taken up by the hydrochloric acid as it reaches the "nitrogen tube," forming hydrochlorate of ammonia. When gas ceases to issue from the tube, the "nitrogen tube" removed, its contents poured into a porcelain or platinum basin, and evaporated to dryness over a water bath; water is added, the solution filtered, chloride of platinum added, and evaporated nearly to dryness, when the ammonia is thrown down as double chloride of platinum and ammonium. From the double chloride, the proportion of ammonia may be found.

The balance used in the analyses is a very delicate one, and is known among chemists as the "Robinson" balance.

Respectfully, your obedient servant,

WILLIAM GILHAM.

Virginia Military Institute, Oct. 25, 1853.

* The above process for effecting the solution of the oxyde of iron, alumina, potassa and soda, differs from the one ordinarily adopted, which is to heat the substance to be dissolved with an excess of carbonate of baryta. The one I have used is recommended in Booth's Encyclopedia of Chemistry, article 'Analysis," and I am certain that for the marls and green sands it is correct, as I have tested it by actual comparison with the other method.

APPENDIX

To Mr. Edmund Ruffin's Essay on the Theory and Laws of Rotation of Crops, &c., in continuation thereof.

A very important use and profit can be made of the pea crop, in diverting the matured peas from their purpose of manuring the field, to serve as food for the hogs designed to be fattened for slaughter. This is deemed the most profitable use of the pea crop in North Carolina and the more southern States—and this use is the main object of the culture, where the growth is most favored by climate. Now that I sow a kind of pea (the early black) which ripens early enough to perfect the grain in this region, besides gathering enough for seed and for food, hundreds of bushels of ripe peas are ploughed under. If the hogs designed for slaughter are suffered to eat as much of this richest of vegetable food as they can take after the partial gathering for seed, and before the ploughing, they will be nearly fattened before having or requiring corn-feeding. In this manner, on my usual extent of pea-fallow, fifty hogs may be nearly fattened, with a saving of two hundred bushels of corn. It is true, that all of the product of ripe peas thus consumed, is so much of the richest of the manure abstracted from the improvement of the field where grown. But the case was above supposed possible when the manuring by this rotation might be greater than desirable; and this different direction of the product is but the taking of one kind of profit instead of another less needed. But this change will be only a lessening, and by no means an entire removal of manuring value of the crop. For though the peas are, doubtless, much the richer manuring portion of the whole plant, yet even when these are mostly

taken away, the residue of vines and roots still return much more to the land than the growth had abstracted of fertility. This fact is sufficiently proved by the general course of culture pursued, and continued improvement of lands obtained, by some of the best farmers and largest pea-growers in North Carolina, who thus usually gather, or consume (by hogs in the field,) nearly all the ripe peas of their crops, and who, notwithstanding, have continued to improve their lands greatly, under rotations of crops which, but for the pea growth, would be necessarily and greatly exhausting of fertility.

EDMUND RUFFIN.

THE SOUTHERN PLANTER.

RICHMOND, FEBRUARY, 1854.

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SCHEDULE OF PREMIUMS FOR THE VIRGINIA STATE AGRICULTURAL FAIR.

In the Extra that accompanies this number of the Planter the reader will find the Schedule of Premiums for our next Fair. We invite particular attention to it, satisfied that it is, in some respects, the most nearly perfect of any in the world.

In some respects it might, perhaps, be altered for the better; for instance, the department of agricultural implements might, perhaps, be enlarged, and made, as it is in England, to come nearer the amount of the premiums for animals, and the department of fruits, &c. should, we think, correspond rather to the importance of the subject than to the extent of land or capital now devoted to it. But when the large amount appropriated is considered we hardly see how more money could now be spared to these branches. The Executive Committee adopted the list after a good deal of consultation, and offer the result to the members of the Society. It is as follows:

Premiums for agricultural experiments,	$1,925
Essays and other written communications, of useful agricultural information, -	790
Best crops and products, - -	630
Live stock, - - - -	2,497
Agricultural implements, - -	990
Fruits, fruit trees, flowers and vegetables,	133
Dairy, honey, hams, &c. - -	33
Household and domestic manufactures,	173
Special and individual premiums, -	530
Additional premiums distributed among different branches, about - - -	600
Total, - - - - -	$8,301

With some few yet to come on the list in the class of individual premiums and premiums on imported agricultural implements.

In view of the uncommon liberality of this list we cannot doubt but that there will be an increased number of competitors for the prizes, and a number of visitors even greater than we had at the first Fair.

We are induced to think so, not only from the very great interest the last Fair excited, and the report that was carried home in regard to it by all parties, but also from the fact that the extension of the rail road lines will give increased facilities for the conveyance, both of visitors and stock.

NECESSITY OF GOOD STOCK TO VIRGINIA FARMERS, AND HOW THEY MAY GET IT.

The low state of the live stock in some of the finest parts of Virginia is a source of anxiety sometimes to their owners, and we have heard some of them speak despondingly of efforts to improve them. That they must be improved and *increased* vastly in numbers, as well as in quality, before Virginia can take her proper place in the agricultural scale is almost too plain a point to argue. We have several times lately had occasion to show that England, the most productive country in the world and the most remarkable for her growth of wheat, which is computed to average twenty-four bushels per acre annually, devotes 66 per cent. of her arable lands to meadow and pasturage, and that, too, when it takes, in addition to the fixed capital of her farmers, a cash capital of forty dollars per acre, (or about five times the value of an average fee simple in Virginia,) to conduct her farms, of which something like nine-tenths are rented lands. And that England and Wales, with a population of one soul to two acres, and an area less than Virginia, had seven mil-

lions more sheep alone, not counting other stock, than the whole United States put together, the numbers being as 28,000,000 to 21,621,483. We have also showed that Ohio, greatly the heaviest wheat grower in the Union, devoted only one-ninth of her soil to that staple, one-ninth again being devoted to Indian corn, nearly the whole of which is fed—and 21 per cent. to meadows and pastures. And this, though she has a fine soil for wheat, a mild, humid climate, exactly adapted to it, and such facilities for market as are afforded by an extensive lake boundary, 1418 miles of rail road, probably now 600 miles more—for the figures are last year's—920 miles of navigable canal, and 450 miles of river shore.

To her deficiency in grass and in stock, and to her want of attention to such as she has, as much as, if not more than to any other cause, do we attribute the present condition of our Virginia agriculture.

Long years ago Arthur Young, the great English agriculturist, said, writing to General Washington, in comment on a system of cultivation which Mr. Jefferson had recommended, "But I have a heavier objection than this, and which bears upon the pith of the subject. How can Mr. Jefferson produce annually 5000 bushels of wheat, worth £750, by means of a cattle product of only £125? I do not want to come to America to know that this is simply impossible: at the commencement it may do, but how long will it last? This is the management that gives such products as eight and ten bushels an acre. Arable land can yield wheat only by means of cattle and sheep; it is not dung that is wanted so much as a change of products. Repose under grasses is the soul of management, and all clearing and tillage to be given in the year that yields green winter food. By such a system you may produce by means of forty oxen and five hundred sheep 5000 bushels of wheat; and if you raise the oxen to fifty and sheep to six hundred, you may have so much more wheat; but it is only by increasing cattle that you can increase wheat permanently. £125 from cattle to £750 from wheat would reduce the poorest farm in the world to a *caput mortuum*, that is to say, to ten bushels an acre, which must be nearly such."

We have seen just such effects as Young predicts from a rapid wheat rotation on very fine lands, we have read of many more than we have seen, and we have no doubt that such will always follow on lands of ordinary quality; on all, indeed, except those whose natural fertility makes them exceptional cases.

Guano may be thought a substitute for stock. We have heard intelligent farmers contend that it is, but we are compelled to differ with them. It is a great blessing to the farmer, but it is not a manure of universal application or endless duration. It cannot be, as a glance at facts will show. "In a crop of wheat," says Professor Hallowell, a practical man, "of twenty-five bushels and three thousand pounds of straw to the acre, there are removed from the soil about thirty-two pounds of potash and soda. But of the 7.97 pounds of alkaline salts contained in one hundred pounds of guano, about six pounds may be considered a liberal estimate of the quantity of potash and soda; that would be twelve pounds of these alkalies put on the land in an application of two hundred pounds of guano. But as the crop contains thirty-two pounds, it leaves the acre of land with twenty pounds less of these important alkalies than before it was cropped, notwithstanding the liberal application of guano. As previously remarked, these alkalies exist in comparatively very small quantities in the soil, and yet they are indispensable to the growth of wheat and every other crop. Now, in a common sense view of the subject, what will be the consequence of continued cropping, and dressing the ground at this rate with guano? It must ultimately exhaust the soil of these elements, and the larger the crops the more rapidly will these elements become exhausted, and then the lands will become again 'worn out,' and less reclaimable than ever." He extends his remarks to other elements of crops which we need not notice.

Guano will, it is true, become the basis of reform in our agriculture, because it will teach farmers what good crops are, and thereafter they will not be content with what they formerly made. But of itself and by itself we are well convinced that it will produce but a fitful improvement. We do not mean to disparage it any more than the doctor disparages calomel when he says it is not a king-cure-all. We are friendly to its use, but we mean to say that its greatest benefit will be in teaching the value of manures, and opening the way for stock husbandry. The experience of Peru, who has used guano, perhaps for centuries, amounts to nothing, because the guanoed lands are always irrigated at each application, twice and thrice in the course of a crop; and water judiciously flowed over land is well known to be of itself a source of vast fertility, and is thought to be the best solvent of those substances which exist in the soil awaiting such action to fit them for the food of plants. In England, moist, rainy England, which buys all the manure she can lay her hands on, the trade in guano decreased from 243,014 tons in 1851 to 129,889 tons in 1852—(of 1853 we have no accounts.) The frauds in the article and the high price are the assigned causes. But there it is not considered a substitute but only an aid of the manures of the farm. "It may probably be said," remarks Professor Anderson, Transactions of the Highland Agricultural Society of Scotland, October, 1852, page 434, (italics ours,) "That if the statements I have made are correct, that guano, far from being beneficial, ought, in the long run, to be inferior to farm-yard manure; *and it would certainly be so if we depended* ON IT ALONE. Its peculiar advantages are as an auxiliary, which supplies a quantity of certain constituents in an immediately available condition, in which they are requisite for producing the rapid growth of the crop through the early stages of its existence; and the enormous mass of farm-yard manure which must be used when large crops are expected, is dependent, to some extent, on the small quantity of its constituents which exist in that condition; so that we generally employ a larger total quantity of the valuable constituents of farm-yard manure than is required for the whole rotation, merely, that by doing so, we may get a sufficiently large amount of those which we wish to act rapidly. The *peculiar merit* of guano is, that by mixing it with farm-yard manure, we can bring up the quantity of immediately available constituents without adding unnecessarily to those which are to be long dormant in the soil. *The practical* fact is that under liberal management by farm-yard manure alone, a soil becomes gradually richer in organic matter, ammonia and phosphates; and it is quite possible, so long as that excess remains to raise crops by the addition of the rapidly acting manure alone; but it is a system which the good farmer will only employ under exceptional cases."

Here, we ascribe a somewhat different action to guano. We have heard of some of its most remarkable results on the poorest lands, and would mention, as an instance only of them, a well attested case where it produced twenty-seven bushels per acre on poor land and only four on rich land of the

same farm. This effect we think is due to its solvent power as much as to its nitrogen, but in the nature of things its action on such lands, if unaided, will produce more rapid exhaustion. The analysis made of a very rich soil in Ohio compared with that of a very poor soil in Massachusetts, showed less diversity in composition than in molecular structure. The Ohio soil was nearly as fine as flour, the Massachusetts sample as coarse as sand; and hence was supposed to result a difference in solubility sufficient to account for the difference in productiveness. If this be so, the poor soil, which by means of 200 lbs. of guano elaborated 1620 lbs. of wheat, or an excess of 1420 lbs. will, of course, have had its solvent (or productive) powers more severely taxed than a richer roil, when natural agents, always superior to artificial ones, are constantly at work. Hence exhaustion will more speedily follow the application of guano.

On the other hand, if the land shall begin to improve, and by means of other agencies, as clover, say, continue to acquire fertility, then, precisely as the fertility increses, is the effect of guano diminished, until, as in the case of good lands, it will cease to repay the application For we have heard of many cases of good lands where guano has failed to act.

We repeat, so fearful are we of misconstruction, that we desire to see guano used, but we warn our farmers not to expect to make of it a substitute for other manures, or to rely upon it to the exclusion of well kept stock in greater numbers than they are used at present.

Western New York with her sheep makes more wheat than any old State, and buys but little guano She does not need it, her lands are too good for it, and the stereotype about her prodigious falling off in wheat is a mistake. Sheep keep up her wheat.

And what is true of New York is still more true of Virginia. Lime will improve the lands of tide water, though, except on her most fertile alluvions, there is a limit to improvement, even there, *by that means alone.* But lime, whether desirable or not, cannot be obtained for the lands of middle Virginia. It is an error to suppose that rail roads will bring it cheap—they cannot transport cheaply enough for agricultural purposes any article which weighs eighty pounds to the bushel. On an average it will not cost the farmers who live on the line of the road less than fifteen cents a bushel—to say nothing of those who must haul it ten, twenty or thirty miles—and it can hardly pay at that price. It is by no means certain that the lands want lime. Experiment alone can decide that point. Thousands of bushels of lime have been wasted on the soils of Massachusetts, and our farmers should consult that experience far enough to save themselves from like loss.

We say, then, they must improve by stock, or, in the long run, improve not at all. We do not speak of such moderate improvements as judicious farmers now make with the ordinary materials and means of the country, but of an improvement commensurate with the general progress of things, and necessary to us, if we would regain our lost ascendancy, or even maintain our present second rate position.

The population of the United States now doubles in every quarter of a century, and impending events may accelerate this rapid rate. If we mean to preserve our rate of wealth and population, our products should also double, and our lands be put in condition to keep up with this arithmetical ratio. It is a blessing that we have guano to begin with, and that it will enable us to leap, as it were, into a better system, to stock our lands with cattle and grasses without that loss of revenue which John Taylor of Caroline contemplated under the old system, but which he urgently advised all to submit to in consideration of the benefits he promised from experience.

How shall the stock and grass be obtained? We answer, with less difficulty than one would expect. But as we have occupied now all our spare space, we shall resume the subject in March.

For the Southern Planter.

INJURY TO TOBACCO PLANT BEDS BY FLIES

A REMEDY.

Mr. Editor,—The ravages of the fly on the tobacco plant beds of Eastern Virginia have so much increased of late years as to call for a more certain preventive or remedy than any heretofore suggested. A first, and sometimes a second series of plants is devoured by the insects, and before a third can attain a growth sufficient for transplantation, the early seasons have passed. The loss occasioned by the delay alone in planting must have been immense; and during the present year many growers of tobacco wholly failed in occupying a part of their hills made for that purpose.

During a recent visit to the county of Amherst I met with Mr. James W. Phillips, an intelligent citizen and planter of that county, with whom I conversed at large on the best modes of rearing and managing tobacco. From him I learned that he was in possession of a remedy against the fly, which he had tried with unvarying success for thirteen years past, with the exception of one year, when no flies appeared. He had not divulged it before, but is willing that it should be made public now. And as it is both simple and cheap I send for publication in the Planter a copy of what was written down from his dictation:

"As soon after the cattle are taken in from grazing and put up for winter feeding as we may be certain that their *manure* will be free from grass seeds, a quantity of this is collected and stored in several barrels. Old flour or lime barrels will answer the purpose. Over each layer of eight or ten inches thickness, pour water until it is moistened through, and then sprinkle a handful or two of *slaked lime.* About four or five handfuls generally suffice for a barrel. These are either to be kept under shelter or covered during wet weather. As soon as the fly makes its appearance—which is generally from the last week in March to the middle of April—sprinkle the mixture, which will now be thoroughly pulverized, over the beds so as nearly to cover the plants. The flies will cease to trouble them and the manure will stimulate their growth as well or better than any other he has ever tried. Mr. P. covers his beds with brush, as is the general custom, and rather thicker than usual; but never removes it entirely until shortly before the plants are drawn. He thinks it better to have *two* layers of brush, one across the other, as in case the plants are too much shaded, the second may be removed without disturbing the first, and thus injuring the plants."

The remedy here proposed may not be as new to all your readers as it was to myself. But I doubt if it be generally known, and Mr. Phillips assures me that, as thus compounded, it is original with him. I have heard of liquid manure, or a weak solution of guano, or the brine of fish being poured over the beds—of lime or plaster of Paris, either singly or successively, sprinkled over the plants—but not with uniform results. It has been said that if brush fires

be kindled at night to the leeward of the beds, the flies will be attracted by the flames. Recent observers of the habits of these interests also tell us that they rarely or never rise more than three feet from the ground, and that beds enclosed by a tight plank fence of that height will keep them out. Of the efficacy of either of these modes I know nothing; but the first I suppose would be but temporary, and the other both troublesome and expensive. Mr. P.'s continued success was attested by several of his neighbors, and his preparation may be considered worthy of trial by many others during the coming season. Should it prove equally efficacious under a variety of circumstances, he will have entitled himself to the thanks of our planters generally, and perhaps to some more solid testimonial of their obligations.

N. F. CABELL.

Nelson, Dec. 7, 1853.

[The above article was crowded out at an earlier period, but we hope it is still in time. All persons who try this remedy, which is certainly inexpensive, will please report result to Southern Planter.—ED. SOUTHERN PLANTER.]

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B. L. Christian to January 1854	2 00
William Benton to July 1854	1 00
B. P. Noland to September 1853	2 00
William Rogers to July 1854	1 00
Isaac Vandeventer to Jnly 1854	1 00
Henry T. Harrison to July 1854	1 00
Joseph Mead to July 1854	1 00
John Janney to July 1854	1 00
William Williams to July 1854	1 00
Noble S. Braden to July 1854	1 00
William Giddings to December 1854	1 00
John Aldridge to July 1854	1 00
Mrs. E. O. Carter to September 1853	1 00
Robert L. Wright to July 1855	2 00
Yardley Taylor to July 1854	1 00
Col. John H. White to July 1854	2 00
John George to July 1854	1 00
Robert A. Ish to July 1854	1 00
John Snider to July 1854	1 00
James M. Laidley to January 1856	2 00
William S. Davis to December 1854	1 00
Littleton J. Chappell to January 1854	2 00
J. R. Bryan to January 1855	1 00
R. W. Morris to September 1854	1 00
Albert S. Jones to December 1854	1 00
A. K. Bowles to January 1855	1 00
J. S. Spangler to January 1855	1 25
Col. Joseph Martin to July 1854	1 00
Garland Haines to January 1856	2 00
R. Kirkland to January 1853	1 00
J. B. Lundy to January 1853	1 00
J. A. Riddick to October 1853	1 00
T. C. Proctor to October 1853	1 00
Charles Turnbull to October 1853	1 00
Turner Saunders to October 1853	1 00
John E. Shell to October 1853	1 00
R. H. Sharpe to January 1854	1 00
John H. Lewis to October 1853	1 00
Thomas Green to October 1853	1 00
Edward Dromgoole to October 1852	1 00
George B. Clark to January 1854	1 00
William H. House to June 1854	1 00
M. Noble to January 1855	1 00
John E. Crowder to December 1854	1 00
William B. Sanderson to December 1854	1 00
Thomas M. Powers to December 1854	1 00
William Holman to December 1854	1 00
William A. Perkins to December 1854	1 00
Dr. R. P. Walton to December 1854	1 00
William C. Flournoy to December 1854	1 00
Joel J. Scott to December 1854	1 00
James Woodfin to December 1854	1 00
Capt. Benjamin Allen to December 1854	1 00
W. S. Daniel to December 1854	1 00
J. P. Woodson to December 1854	1 00
Henry J. Brown to December 1854	1 00
W. M. Thornton to December 1854	1 00

William M. Bagley to January 1855	$1 00
John Morton to January 1855	2 00
R. H. Whitfield to January 1854	5 00
James M. Smith to January 1855	8 00
Col. P. W. Meredith to January 1855	1 00
Col. W. C. J. Rothrock to January 1854	2 00
Dr. James M. Blanton to December 1857	4 00
Dr. Carter to January 1855	1 00
R. Turnbull to July 1854	1 00
P. W. Hairston to July 1854	1 00
Lewis Mabry to October 1854	1 00
William Rixey to June 1854	1 00
Benjamin C. Anderson to September 1854	2 00
Samuel T. Chandler to January 1855	2 00
Col. T. C. Dennis to September 1854	1 00
James R. Cumpton to January 1855	1 00
R. W. Griswold to January 1855	1 00
Capt. Jacob Morton to June 1854	1 00
Capt. Samuel D. Morton to January 1854	1 00
Henry M. Vaughn to April 1854	1 00
William H. Clark to January 1855	1 00
Larkin Hundley to January 1854	2 00
John T. Van Deusen to January 1855	1 00
James E. Harris to September 1854	1 00
George W. Ruffin to January 1855	1 00
William A. Leavitt to January 1855	2 00
A. G. Moody to January 1855	3 00
Robert Campbell to January 1855	1 00
Thornton Hanshaw to January 1855	1 00
Josiah Duke to July 1854	1 00
J. J. Daly to January 1855	5 00
Dr. S. Maupin to January 1855	1 00
Patterson Allen to January 1855	1 00
Thomas Hite to January 1855	1 00
Thomas E. Baylor to January 1855	1 00
Dr. John M. Shelton to January 1855	1 00
Robert Henderson to January 1855	2 00
N. Sowell to January 1855	1 00
Jame R. Leath to January 1855	1 00
Dr. James L. Cabell to June 1854	1 00
Meredith Helm to July 1854	1 00
Samuel W. Martin to July 1854	1 00
Dr. D. E. Watson to January 1854	1 00
B. H. Eubank to September 1853	2 00
William Rodes to July 1854	1 00
Rev. James Fife to January 1853	1 00
J. H. Maddex to September 1854	1 00
Dabney Minor to September 1854	1 00
James Davis to January 1855	1 00
Dr. S. Patrick to January 1855	1 00
Judge George W. Summers to January 1855	1 00
George H. Matthews to December 1854	1 00
Richard H. Carter to September 1854	1 00
Thomas F. Buck to December 1854	1 00
William P. Winfree to January 1854	1 00
R. G. Grigg to January 1854	1 00
Capt. G. Choice to January 1855	2 00
Judge Field to January 1855	1 00
Dr. George C. Scott to January 1855	1 00
Dr. J. F. Earley to January 1855	4 00
Dr. William Martin to January 1854	1 00
Col. John Mercer Waller to January 1855	1 00
William H. Mitchell to November 1854	1 00
Manlius Chapman to January 1854	5 00
W. M. Tate to April 1855	1 00
Daniel Wilson to September 1854	2 00
Joseph C. Burton to January 1854	1 00
N. W. Harris to January 1855	1 00
John S. Hardaway to January 1856	3 00
B. A. Curry to July 1851	5 00
B. W. Roper to January 1855	1 00
L. D. Horner to January 1855	1 00
Dr. John A. Davidson to June 1857	5 00
Richard V. Watkins to July 1854	1 00
George W. Whitfield to January 1855	1 00
R. F. Gaines to January 1855	$1 00
A. P. Sennett to December 1855	1 00
S. J. Cabell to December 1855	1 00
T. M. Shelton to December 1855	1 00
Frank Vicars to December 1855	1 00
B. S. Thompson to December 1855	1 00
Frederick Gillum to December 1855	1 00
Dr. George Fleming to September 1854	1 00
Jacob Graves to September 1855	1 00
John G. Guthrie to July 1854	1 00
R. U. Brooking to January 1854	1 00
Mrs. Dr. W. B. Smith to January 1855	1 00
Dr. E. G. Clay to September 1854	1 00
Rev. William Crawford to January 1855	1 00
James D. Massenburg to January 1855	2 00
Joseph E. Gillet to May 1855	2 00
Warren Edwards to May 1855	2 00
Alfred Ricks to January 1855	1 00
Fras. W. Connor to January 1855	1 00
John Lawton to January 1855	1 00
H. H. Cocke to January 1855	1 00
Camm S. Garrett to January 1854	1 00
Edward W. Shepherd to January 1855	1 00
R. S. Farmer to January 1855	1 00
A. D. Martin to January 1855	1 00
Rev. Samuel Taylor to January 1855	1 00
D. H. Flournoy to January 1855	1 00
E. F. Perkinson to January 1855	1 00
Col. R. W. Baylor to September 1855	2 00
R. B. Washington to July 1854	2 00
Capt. James G. Hunt to July 1854	1 00
Martin Slaughter to January 1855	2 00
Henry Taylor to January 1855	1 00
Jabez Gravely to January 1855	1 00
William W. Garrett to January 1855	2 00
H. S. Hathaway to January 1854	1 00
N. W. Diggs to January 1854	1 00
James K Marshall to January 1855	3 00
Dr. J. L. Burroughs to October 1854	2 00
John A. Hutchens to January 1855	1 00
Frederick Hanbury to January 1855	1 00
William L. Parson to January 1855	1 00
Dr. H. T. Minor to January 1855	1 00
Archibald Gills to January 1854	1 00
Benjamin R. Woody to January 1855	1 00
John C. Moncure to September 1854	1 00
James D. Watts to January 1855	3 00
R. C. L. Moncure to January 1855	1 00
James Ruffner to January 1855	1 00
Woodson Hughes to January 1855	2 00
Charles Yates to July 1854	1 00
James D. Gibson to April 1854	1 00
A. & W. Hogue to April 1855	1 00
A. Wright to April 1855	1 00
Columbus Stanley to April 1855	1 00
Henry G. Tucker to April 1855	1 00
B. H. Smith to April 1855	1 00
A. W. Quarrier to April 1855	1 00
John A. Wright to April 1855	1 00
Joel Ruffner to April 1855	1 00
William Gilkeson to April 1855	1 00
John G. Carr to April 1855	1 00
F. Brooks to April 1855	1 00
J. S. O. Brooks to April 1855	1 00
Edward Lewis to January 1855	1 00
Samuel Hannah to April 1855	1 00
S. A. Miller to January 1855	1 00
J. D. Lewis to January 1855	1 00
William Tompkins, Jr., to January 1855	1 00
B. L. Cole to January 1854	2 00
J. R. Coupland to January 1855	1 00
Samuel L. Brooke to January 1855	1 00
Peter D. G. Hedgman to January 1855	1 00
John M. Conway to January 1855	1 00
John S. Ellis to January 1855	1 00

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