THE SOUTHERN PLANTER.

Devoted to Agriculture, Horticulture, and the Household Arts.

Agriculture is the nursing mother of the Arts.—*Xenophon.*

Tillage and Pasturage are the two breasts of the State.—*Sully.*

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Air: How Invaluable to the Successful Husbandry of the Soil and its Produce, Animal and Vegetable.

In our former observations on this subject we directed attention to a general view of it, promising to notice on a subsequent occasion the individual case of soils, plants, and animals, under the different atmospheric circumstances in which they are found. We now propose the fulfilling of that promise.

In doing so, let us examine wheat, grass, and turnips, grown in different soils, climates, and under different systems of cultivation.

Under the first, as to soil, the practical question at issue may be thus stated: How far does the atmosphere affect the quality of wheat on any individual soil? That the nature of the soil and its atmosphere influences the composition of both the grain and straw of this cereal, is a fact with which farmers have been familiar from time immemorial. To what extent, therefore, is this dependent upon atmospheric phenomena? Calcareous soils, for example, and others abounding in organic substances, yield wheat containing a larger proportion of gluten or nitrogenous matter, than do soils of opposite quality. How much of this nitrogen is due to the nitrogen of the atmosphere, and how much to that of the manure incorporated with them?

In the case of a calcareous soil, the decomposition of lime by means of air and water obviously works up the oxygen of both the latter, liberating their nitrogen and hydrogen; while they, uniting together under favourable circumstances, form ammonia ($N1 + H3$). In this manner 82.545 lbs. of nitrogen, and 17.455 of hydrogen, would make 100 lbs. of ammonia, requiring the decomposition of 107.2 lbs. of common air and 167 lbs. of water. Now, as this quantity of ammonia is a sufficient dose for two acres of land, yielding an ordinary crop of wheat, it will readily be seen that the decomposition of this quantity of air and water over such an area, the liberation of this quantity of nitrogen and hydrogen, and their uniting together, is the most likely source from whence the growing wheat plant derives a large portion of its nitrogen.

Pure ammonia, however, cannot thus be formed in a calcareous soil, as it always combines with other substances; but this does not in the slightest degree affect the question at issue, for it signifies little what salt of ammonia may be formed, so long as it is formed and consumed by the plant.

In soils, again, rich in animal and vegetable matter, a similar result takes place during the process of decomposition. As in the case of calcareous matter, air and water are necessary to effect this change, during which the oxygen of both produces, with the vegetable matter, carbonic, ulmic, and other acids, while the nitrogen and hydrogen liberated form ammonia.

If, however, we suppose such a vegetable soil improperly drained, so that decomposition takes place in the absence of air, or a sufficient supply of it, then the vegetable matter and oxygen

form the carbonic and other acids; but the hydrogen now unites with the carbon, forming carburetted hydrogen, or the gas of low-lying marshy lands—a gas alike injurious to animal and vegetable life.

Wet marshy soils of this class are, perhaps, the worst for wheat culture of any, being deficient of ammonia to supply nitrogen for the manufacture of gluten. For the successful growth of this cereal, proper drainage and aëration are essential requisites. A certain degree of moisture is, no doubt, necessary to supply hydrogen; but in our moist climate, few crops require so little rain as wheat, while none require a larger supply of atmosphere, beans and peas excepted.

On sandstone and clay soils, naturally deficient of organic matter, and where the inorganic is less subject to decomposition, on the contrary, wheat seldom yields very abundantly, while the quality of the flour is inferior, owing to the small per-centage of gluten which it contains.

This deficiency of crop, and the inferiority of quality, are thus accounted for: In the first place, the inorganic matter being less subject to the action of oxygen than limestone, the decomposition of air and water is consequently also less, so that the supply of naturally manufactured food, both organic and inorganic, is insufficient to supply the wants of a healthy and luxuriant vegetation. And in the second place, the decomposition of air and water being less, the manufacture of ammonia is also less, and, hence, the formation of gluten.

In the case of grass crops again, results are similar, the produce of dry calcareous or vegetable soils being better for rearing and fattening stock, than that of others of a different quality not so subject to the decomposing influence of the atmosphere. We might quote many examples from the rich grazing districts of England and Ireland, in proof of this proposition, were it necessary.

In low-lying, marshy grass-lands, however, the example is widely different from that of wheat-land, in more respects than one. In the first, for example, luxuriant crops of an inferior quality are often produced by this class of soils; and although not equal to straw as food for cattle, they make nevertheless excellent manure. As such we have used immense quantities, both in a green state and dry, for littering stock, and always had fine crops.

For pasturage they are not well adapted: the marshy gases arising contaminating the atmosphere, and thus injuring the respiratory functions of stock, or otherwise affecting their health. In corroboration of this, we shall mention two examples: In the first, large tubular swellings break out, principally about the neck and chest of cattle, the malady generally terminating fatally. And not only are they affected thus when grazing, but also when consuming in the straw-yard, alike in summer as winter, the produce of such lands, as turnips, hay, and straw. In the second example cattle never thrive well; while they change their colour, whatever it may be, to a "dirty dun."

Some low-lying wet grass-lands, we must observe, are exceptions from the above examples, the produce being rich in quality and abundant in quantity. This is owing to the water not being stagnant, but rising to the roots of plants by capillary action, and bringing a sufficiency of lime, alkaline, and other salts, in solution, to counteract acidity and supply the necessary quality of food which otherwise would be wanting. The grass, however, owing to the decomposition of air being less (and consequently the produce of naturally-formed ammonia), is generally deficient of nitrogenous element, and therefore is better adapted for yielding butter than cheese or butcher-meat; but in practice this deficiency is easily supplied by the addition of a little pea or bean-meal and cake.

Like grass, the turnip delights in a rich, well-drained, calcareous soil, or one full of vegetable matter, with a moist climate, both top and bottom having a liberal supply of air. An abundance of pure air is essential for the growth of this invaluable plant; for without plenty of room, a well-pulverized soil, and an atmosphere free from deleterious matter, a heavy crop cannot be grown. At the same time more water appears to be assimilated in the process of vegetation than nitrogen from the atmosphere; thus proving that as the turnip is a large consumer of ammonia—a great decomposer of air and water—nitrogen-gas must be given off from its leaves.

With regard to climate, it is much more diversified than is generally imagined. In common conversation we talk of the north, south, east, and west, as cardinal distinctions; but when we come to examine the details of even a single province, let it be situate where it may, how different is the atmospheric circumstances of one farm from that of another! and how unlike are the results on animal and vegetable life!

Such diversities are to be attributed no less to geological than geographical causes. When we enter the field, may it not be said, How little is yet known of the "chemistry of common life!" for here the undivided labours of the farmer are directed to one continued process of decomposition! as if man had but one grand object in view—viz., to pull down as fast as Nature builds up the animal and vegetable kingdoms! Nor are results to be measured by his own individual efforts; for mechanical appliances without number are now being brought to bear upon the soil, exposing it more effectually to the decomposing influence of the atmosphere, in order to increase both produce and consumption.

This decomposition of the soil and its produce must affect the contiguous atmosphere less

or more, and hence the quality of the crop. The smell of newly-ploughed land is sensibly felt, for instance, on entering the field, and from different qualities of soil it is equally different. From time immemorial, ploughmen have experienced certain localities more healthy than others; and the difference is obviously to be attributed to climate, as affected by the volatile matter given off in the process of decomposition.

We might here enter into a large amount of detail, quoting examples from different geological formations, did our limits permit; but this blank we shall leave our readers to fill up themselves. If they take up a clod and break it, they may easily detect what the smell or volatile matter given off in the atmosphere is composed of. Or if they can analyze it, they may also be able to say what will be liberated in the process of decomposition. All that we shall add is this—Were every farmer in possession of the analyses of the different qualities of soil he cultivates, and volatile matter given off in the process of decomposition, it would prove an interesting source of information to him; and when a few sovereigns would obtain it, why should it not be had?

The atmosphere, again, is sensibly affected by different crops, and that differently at different stages of their growth. Who has not felt, for example, the intoxicating aroma of peas, beans, and clover in flower?—the fragrance of the meadow during hay-making?—the pungent smell of turnips when growing rapidly?—and that of a field of barley behind the reapers or reaping machine in harvest? These, although prominent examples, are only a few of what experience is familiar with, and which might readily be quoted for the sake of illustration.

Our next topic is cultivation. How does it affect the influence of the atmosphere upon the soil and its produce?

With regard to the soil, it is only when accompanied with a sufficiency of moisture that the atmosphere can enrich it. If divested of water, the scorching effects of a summer's sun would render our fields as barren as the deserts of Arabia; but with the requisite supply of this invaluable fertilizer, the rays of the sun are powerful auxiliaries to the enriching of them. To "keep in the sap" and "out the drought," and yet admit the free circulation of the atmosphere, has long been acknowledged one of the cardinal points in good farming.

Deep culture and drainage, again, by increasing the capacity of the soil for holding air, add greatly to the means of enriching it. Probably more of the success of the Lois-Weedon system depends upon this, than to the mere fallowing of the "intervals" between the beds of wheat or other kinds of crop; so that the question may yet be raised whether equally deep culture, with proper attention to seeding the ground uniformly, may not produce equally beneficial results. But be this as it may, the the chemical effect of air and water in a greater depth of soil is manifest from what has already been said; for the decomposition of the soil, air, and water (and hence the formation of soluable matter and ammonia) will be directly as this depth—twice the depth of ordinary cultivation by the plough producing twice the quantity of fertilizing matter, while from the greater depth there will be less escape or waste of volatile substances.

The free circulation of air, again, access of light, and rays of the sun, among growing crops, are questions of equal importance. In this respect wide drilling is highly advantageous, while intervals may produce a more healthy and free circulation. But much of this will depend upon special circumstances; for clean flint straw on the wide-drill system may admit of a freer circulation than coarse flaggy straw deficient of silica with wide intervals.

Many exceptions may no doubt be taken to the wholesale manufacture of ammonia, as advocated, from the nitrogen set free in the decomposition of air, uniting with the hydrogen of water when undergoing a similar process; but granting them to be true, the practical question in the field is obviously to reduce exceptions of this kind to the common rule. This may be done in various ways—as by draining; deepening the soil; adding clay, calcareous, and vegetable matter to sandy lands, to retain moisture and produce decomposition; sand, vegetable, and calcareous matter to clay lands, to promote the free circulation of the atmosphere, and its decomposition along with that of water; in short, anything which will promote the decomposition of air and water in the soil, so that the nitrogen and hydrogen set free shall be united so as to form ammonia. We see no other way of accounting for the extraordinary fertility produced by improvements of the above kind, than by working up the nitrogen and hydrogen set free in the process of decomposition into ammonia, or some of its compounds, as food for plants. The decomposition of farmyard manure in the soil, and even clean straw in clay lands, obviously works up the nitrogen of the atmosphere and hydrogen of water into matter more fertilizing than their own constituent elements will satisfactorily account for. The advocates of exclusive liquid manuring overlook the economy of decomposing vegetable matter in the soil, and the additional supply of ammonia derived from this source by means of the nitrogen and hydrogen liberated in the process.

The Gradual Improvement in the Thrashing Machine.

"Portable threshing machines," wrote London twenty-five years ago, "are very common in Suffolk; it being not unusual for an industrious labourer, who may have saved thirty or forty pounds, to own one worked by three or

four horses. Reaping-machines and steam ploughing-machines will probably in a few years be owned and let out for hire in a similar manner." After more than "a few years," reapers and steam-ploughs have not yet attained a similar position with itinerant thrashing-machines, although rapidly coming into extensive adoption by large farmers. However, thrashing-machines themselves have taken a form that our author never anticipated: the portable steam-engine, and that marvellously compact piece of mechanism, the combined threshing, shaking, winnowing, and finishing-dressing "drum," "barn-works" or "mill," having completely raised the character of agricultural machinery, and as a necessary consequence multiplied mechanical knowledge among farmers and their workmen. Directly it was proved that steam power could be advantageously conveyed from farm to farm, not only a higher velocity of the drum, and a greater amount of work in a given time was achieved, but the operations of straw-shaking and winnowing, previously confined almost entirely to threshing machinery erected in buildings, were now added to the portable machines. As far as mere knocking out of the grain is concerned, we have now comparatively little to wish for, and may expect only slight improvements in augmenting the quantity done, economising the motive-power, avoiding splitting, and accommodating the beaters and concave to all conditions of "stuff." In the apparatus for separating the corn, chaff, and straw, considerable advances may yet be made; and as next July will try what our inventors and manufacturers can do for us in this department, it may be well for farmers to devote some consideration to it beforehand.

One of the earliest ideas in connexion with thrashing by machinery was that the separation of corn chaff, and straw, should be effected, as well as mere shelling out the grain from the ear. Thus Michael Sterling, more than a hundred years ago, applied the principle of flax-hulling to beat out corn, in a machine consisting of a vertical shaft carrying arms or blades revolving in a cylinder—the corn being fed in at top, and the straw and grain separated by riddles and fanners underneath. This was thirty years before the invention of the drum and beaters by Meikle. In 1789, three years after Meikl's first machine was constructed, with a drum of four scutch-beaters and a pair of feed-rollers, the first machine having a circular rake attached for shaking the straw, and fanners below for cleansing the grain, was erected in Northumberland. In 1795, Wigfull, of Lynn, in Norfolk, patented a machine in which the corn falling from the drum was carried by means of a shaking screen and rolling-cloth, or endless web to the blast of a fan, where it was separated from the chaff. Of course our space will not permit us to chronicle here all the successive improvements in thrashing machinery; but these instances show how ancient is the addition of shaker, riddle, and fan, which we are still labouring to improve. The straw-shakers of the old Scotch machines are generally known as being large drums, armed with rakes, revolving above fixed curved racks or screens, over which they pass the straw; some machines having one of these drums "overshot," and furnished with brushes as well as rakes or forks. The separating apparatus consisted of a couple of winnowing-machines underneath, similar to those made for hand-power, catching the grain and chaff from the drum and shakers by means of a large deep hopper.

The parallel-motion shaker, so much in favour now appears to have been invented in 1840, by Mr. Morton, of Whitfield Example-farm, and erected as part of the steam-thrashing machinery there by Mr. Clyburn, of Uley Works. It consisted of parallel spars of wood, 6 feet long, and three-quarters of an inch thick, with three-quarter inch spaces between them; these being joined together in two alternating sets, were jumped by double cranks on two revolving shafts, as our present box-shakers are. This was about the first time that straw was subjected to a real "shaking." Other parts of this machinery were equally ingenious. The corn fell before the blast of a fanner, then down before another; the light grain and short straws thrown out by this first winnowing being taken up by an "elevator" again to the feeding-board of the drum. The winnowed corn was carried up by other elevators to another winnower, or rather two, one under the other, with two fans, and was finally again elevated to the sacks, or passed through a "barley-hummeller." An endless web was tied at the mouth of the drum, to carry the unthrashed straw gradually to the beaters. Since that time, this web has been abandoned; another first winnower has been added, fed by an endless web beneath the drum and shaker; and the corn after falling before the first blast is sifted sideways into the hopper of the two lower dressing-machines; and a horizontal cylindrical sieve or "separator" was also applied. The idea of adapting winnowing apparatus to *portable* thrashing-machines, carried into effect by the Lynn machine-maker, in 1795, was revived just half a century afterwards. Earl Ducie exhibited at the Southampton Meeting, in 1844, a "recent and scarcely completed machine," the invention of Messrs. G. Parsons and R. Clyburn, which Mr. Miles reported as being "truly original." At Shrewsbury, in 1845, this machine was driven by Dean of Birmingham's portable engine, itself a great novelty, and awarded a prize of £10. It thrashed, cleaned, and finally sacked the grain; and Mr. Parks, in his report, said "It is a powerful machine, and possibly adapted to the very large rather than to the moderate sized farm." In 1846, at Newcastle, a thras

ing-machine was exhibited by Cambridge, having a reciprocating rake attached, for the purpose of collecting and passing the straw from the drum without harbouring the grain; and the lower part of the machine was inclosed so as to form a box or receptacle for the grain to fall into. But up to a year later than this period we find that improved horse-power machines, without dressing apparatus occupied the most prominent place in the catalogues of the great makers; while hand-power thrashing machines were much in request as noveltics. At Northampton, in 1847, Hornsby showed a thrashing-machine with a revolving shaker; Cambridge one also, with a shaking apparatus attached; and J. Cornes, jun., of Market Drayton, a thrasher with straw-shaker and elevator, the shaker six feet long; Hayes, of Elton, had a straw-shaker; and Clyburn exhibited a horizontal cylindrical "separator." Ryland and Dean, of Birmingham, however, showed a complete machine for thrashing, winnowing, and bagging the grain. At York, in 1848, Hornsby had his improvement of Clyburn's shaker; Summers, of Wold Newton, a rotary straw-shaker; Scott, of Belfast, a revolving-rake shaker; Humphries, of Pershore, a thrasher with winnowing apparatus and shaker; Garrett, a thrasher with straw-shaker and jogging screen for separating the colder and refuse from the grain; while Abbey, of Dunnington, exhibited a horse-power thrashing-machine with blowing-case, riddles, and elevators which filled the sacks with corn; and Burrell, of Thetford, gained a silver medal for his portable thrashing and dressing machine with parallel-bar shaker, invented by W. Palmer, of Southacre, capable of thrashing five or six quarts per hour, and delivering the corn, chaff, straw, and siftings or short straws in separate places. The price was only £75, yet the machine was at that time supposed to be very cumbrous for ordinary farm use. At Norwich, the next year, Clayton and Suttleworth produced their box-shaker, three feet wide, and fourteen feet long; Crosskill, also had a shaker, "on a new principle;" Hornsby showed a double-cranked or jumping straw-shaker; and Sargison, of Wisbeach, a shaker having sieves or riddles of perforated galvanized-iron, which propelled the straw and pulse forward, while the grain sifted through. In addition to Burrell's threshing and dressing machine, Cambridge showed one invented by Humphries, for thrashing, winnowing, and weighing; Holmes, of Norwich, a horse-power machine with a newly-invented jog colder riddle, and a new straw-shaker; Gerrett, a thrasher with chaffing apparatus; and Ferrabee, of Stroud, a machine with double-crank shaker, and an endless band for delivering the corn and chaff to the elevator which carried it to an ordinary winnowing-machine. And it is noticeable that the manufacturers felt it necessary to call attention to the fact that their portable machines, for doing all this work at once, did not require to be removed from the carriage-wheels on which they were mounted. In the *Farmer's Almanac*, for 1850, appeared the first engraving of a portable combined thrashing machine, viz., Garrett's; the shaker consisting of spars with spikes rotating upon cranks at the inner end and vibrating on rocking-bars at the other. About the same time came out Clayton and Shuttleworth's portable combined machine; the shaker-boxes having a parallel motion, by means of wheels and spindles connecting the crank-shafts, instead of connecting-rod and cranks as before; and there was a vibrating trough extending the whole length of the machine. Tuxford's table shaker-off was also introduced; at first having a rotary jumping movement by means of mitre-wheels and a spindle connecting two crank-shafts underneath, instead of hanging on slings as at present.

It is only six or seven years, therefore, since we obtained the portable thrashing-machine in its present form; that is the vital parts which are now being improved and altered (but still generally adhered to) in every possible form. We may mention as one of the greatest and most extensively-adopted improvements, Humphries' divided and reciprocating trough or shoe; and as variations from the common form, Ransome's revolving Binsmead shaker, and Hornsby's worm or screw for feeding the riddles.—*Ib.*

The Incrustation of Cereal and other Seeds.

BY F. R. DE LA TREHONNAIS.

I.

Formerly, when science was still in its infancy, experience to a certain extent, but routine especially, were the only guides of agriculturists in their modes of preparing the ground for the reception of the seed. Farmyard manures and bare fallows were the only means of restoring the spent energies of the soil; and these were then, and are even now to a great extent, indiscriminately resorted to, without any regard to the chemical constitution of the soil, or the requirements of the plants that are to grow upon it. Analytic science, and the wonderful discoveries of vegetable physiology, have of late years thrown a great deal of light upon the subject of manure, its mode of application to the soil, and its assimilation by the plants. And yet, practically, little progress has been made. We have superphosphate, it is true: we see a great many kinds of artificial manures daily advertised in our agricultural papers; but, after all, the progress we have accomplished is by no means adequate to the strides which science has made in the analytic knowledge of manures, in the exact appreciation of their fertilizing qualities, and their action upon vegetation in various

plants. We still cart away to our fields the same ponderous loads of farm-yard dung, a large per centage of which is of no earthly use, and can only be regarded as the huge vehicle of a very minute proportion of ammonia and alkaline salts. Even guano and superphosphate of lime are encumbered with a large proportion of useless ingredients, all of which are costly to purchase and cumbersome, and therefore expensive to carry. Besides, what a large proportion of the manure which we lay over our fields is utterly lost to the crop we want to grow! what a large proportion is eaten up by noxious weeds; or disseminated through a part of the soil untouched by the ramifications of the roots, and therefore immediately useless! On the other hand, we know, from clear demonstration, what the substances are which each kind of crops draws from the soil; we know to a fraction the quantity of each of those substances respectively; and when we come to compare their aggregate weight at per acre, with the quantity of manure which we have laid over the extent of ground, we are astounded at the difference in bulk and weight.

II.

If a plant is dried and burnt, the little pinch of ashes that remains, after complete combustion, represents the amount of mineral substances which the plant has drawn from the soil. The rest, which has evaporated in the air by the process of combustion, represents those constituent parts which the plant has derived from the air. Chemistry tells us exactly what substances the ashes contain, and in what proportionate quantities. It is then obvious, that either the soil or the manures put on it, or, as is more generally the case, both combined, have supplied those substances to the plant, without which it could not have arrived at maturity. But here we may well pause, and ask ourselves whether, in order to administer to the plant so small a quantity of matters—another and a more simple mode cannot be found; for that quantity, though it be multiplied by the number of plants in an acre of ground, still remains comparatively minute in the extreme, when we compare it with the bulk and weight of the 20 or 25 cubic yards of dung we have laid over it, besides the pulverulent artificial manure or guano we have drilled with our seed. Again, if we calculate the cost of that manure and the value of the labour which its use has necessitated, we find that the little heap of ashes which has been the result, has cost us an immense sum of money; in fact, a much higher sum than the pure chemicals of which it consists could be bought for in the trade.

III.

Hence, the general tendency of efforts on the part of both scientific men and practical agriculturists towards concentrated manures, that is, diminishing the bulk of useless substances, serving merely as vehicles to the really fertilizing element, in order to render them more portable, and more energetic, proportionately with their bulk. Abstractedly this is evidently the goal of our progressive ideas in agriculture; that is, the simplification of all the means, either in labour or manures—the one by concentration of fertilizing energies; the other by means of ingenious machinery, and especially the use of steam-power in field as well as barn operations. It is true to a certain extent that, apart from the primary purpose of restoring the exhausted fertility of the soil, stable and other bulky manure have other advantages, mechanical and thermal; for instance, in dividing a stiff soil, and imparting to it a higher temperature by decomposition from fermentation. But, with thorough drainage, these advantages have become less depending from the action of stable manure; and I have no doubt but, as we progress with time, the corn-growing farmer will no longer be obliged to have recourse to the present troublesome and expensive mode of manufacturing his manure. A more delicate delineation will divide the operations of the corn-growing from those of the breeding and grazing agriculturists, by which the pursuits of the farmer will become less complicated, demanding a smaller capital, diminishing his risks, and materially adding to his gain. Every farmer in England knows well that the lean stock he is obliged to feed on his farm brings him no immediate profit; and, were it not for the manure, he would incur a positive loss—setting for nothing the labour, anxiety, risks of mortality, and the locking up of capital, which the feeding of stock entails.

IV.

From the foregoing preliminary observations, we are naturally led to ask the question: How are these disadvantages to be removed? How are we to turn scientific discoveries to a practical account? How are we to concentrate our manures, and simplify their fertilizing constituents, so as to reduce them to the bulk of the amount actually assimilated by the crop; and, having succeeded in this, how are we to apply them?

A few weeks ago I communicated to this paper the translation of a very remarkable memoir upon the nutrition of plants, by the celebrated Boussingault, describing a series of experiments which clearly demonstrated the possibility of enabling a plant to accomplish all the phases of its existence, viz: its germination, normal growth, bloom, fructification, and maturity, in pure calcined sand, in which were introduced pure phosphate of lime, vegetable ashes, and nitrate of potash, which contain the mineral constituents of the plant selected for the experiment—*Helianthus argo-*

phyllus. Here, it is very obvious that the soil was essentially used only as a vehicle to the plant wherein it might strike its roots, and also to the ingredients which were added as food for its development and maturity. So it matters not how destitute of every nutritive element a soil may be, if it do not contain any substance noxious to vegetation—provided it can be supplied with the constituents of the plant which is to grow from it. If those constituents may be so placed in close proximity to the roots that they may be all absorbed by the plant in the course of its development, there is no necessity of placing in the soil a larger quantity than will be assimilated by the plant. In other words, if the analysis of the ashes of the plant shows that it has absorbed, say ten grains of the various elements added to the soil, and in respective quantities, if it were possible to introduce those substances in so close a proximity to the roots that the whole might be integrally assimilated, there is no doubt but the mere addition of exactly ten grains of the mixture, in the same proportion as found in the ashes, would be quite sufficient to insure the normal development of the plant.

It must be admitted, however abstract the foregoing proposition may be, that if the principle it propounds could be practically applied, it would be the very limit to which progress can attain; and as I have already remarked, it is impossible not to perceive that it is to that concentration and simplification of means that we are now directing all the efforts of our skill, knowledge and ingenuity.

Boussingault, in his recent experiments in the production of what he calls a *limit* plant, has proved that the seeds of many plants contain the necessary quantity of nitrogen, not only for the germination of the plant and the nutrition of the nascent stem and leaves before the radicals have been sufficiently developed to draw a supply from the soil, but also to the production of a perfectly organized plant, though exceedingly reduced in its dimensions. In fact, such a plant—after several months' existence in the open air, or even in a confined atmosphere—has been found to weigh but very little more than the seed from which it sprang. This clearly shows that the extent of the organism of that plant was limited by the quantity of the nitrogenous principles contained in the seed; but as soon as he applied to the soil (exclusively composed of calcined quartz sand, not containing a particle of decomposed matter or mineral manure) a small quantity of phosphate of lime, nitrate of potash and vegetable ashes rich in silicate of potash, the plant immediately sprang up from its torpor, and grew luxuriant and strong, bloomed and brought forth matured seed as well and as rapidly as another plant of the same kind had done upon a garden-strip richly manured.

This experiment clearly shows that the soil upon which the plant grew exercised no immediate influence whatever upon the growth of the plant, as far as its nutrition went, but merely as a vehicle for heat and moisture, as well as the holder of the plant and of the pure mineral salts upon which it lived and developed itself. This naturally leads us to ask the question, whether, instead of incurring great expense and trouble in manuring the soil thoroughly with heaps of dung containing but a small per centage of fertilizing matter, which is still reduced and less available to the plant by being disseminated over a larger surface than the roots of the plant can possibly compass, it be not possible to manure the seed itself, that is, surround it by a crust formed of the very mineral substances which are necessary to its growth, in the same proportion as they are found to exist in the seed, and in a sufficient quantity to represent exactly the weight of the aggregate mineral substances which are abstracted from the soil by the well matured normal plant? This crust could then be considered as the mere extension of the seed to a larger bulk; and as the seed contains what is necessary to feed germination, and even to form a complete plant, though limited in weight to the extent of food contained in the seed, so the seed being increased to any required number of times its size and weight by the agglomeration of substances, such as phosphates, nitrates, and silicates, would be enabled to supply to the growing plant the necessary elements of normal growth and perfect maturity.

VI.

This is indeed no new theory, and many have been the attempts even in times of remote antiquity to realize it in a practical manner. Many are the inventors of wonderful liquids, in which the seeds were to be steeped, and thereby imbibe all the required elements of nutrition and fertility. All these have failed, not because the principle was not a sound one, but because it was not properly applied. For it is obvious that a liquid manure, however rich in fertilizing elements, could not fix these round the seed in a sufficient quantity so as to increase its store of nutritive matters—this can only be done in a solid form. Then, until very recently there was also the insuperable difficulty arising from ignorance, science not having yet shed the light of its discoveries on the mysteries of vegetation; and the wonderful action of phosphates, nitrates and silicates upon vegetation, although practically known, had not been determined with sufficient minuteness and accuracy to lead to any thing like an authentic formula of proportion and quantity. But failures, however complete they may be, in carrying out great ideas, are no arguments against a renewal of efforts; and when these failures, as in the case of steam-engines, railways, reaping machines, or the application of steam to the cultivation of

the soil, are found to act rather as incentives to the ingenuity of men, instead of damping their energy and the buoyancy of their hopes, we know it from the experience of the last thirty years that it is a sure sign that the idea is good, and will be ultimately carried out.

VII.

But there are objections to this system. What system is free from objections? Some say that the mineral matter with which the seed is enveloped, on being dissolved in the soil, will settle immediately around the neck of the roots, which will naturally dive away from it, and it will then become useless to the progress of the plant after it has attained a certain development. I believe that this objection is more specious than real; for every one must have observed that when a seed has fallen upon a manure heap, and there germinated to a plant, if the plant be pulled up, it is found that the roots are very short and shaggy, and do not seem to have penetrated beyond a very limited area, the number of rootlets making up for the deficiency of their length. This seems to me easily accounted for; because the roots, finding in their immediate vicinity a sufficient supply of nutritive elements, have no inducement to dive at any great length in search of them. The instinct displayed by the roots in search of food is truly wonderful, and many examples of their astounding sagacity might be adduced. I have read somewhere the instance of the radicle of a plant diving to the depth of many feet, and fixing itself into a bone that was buried there, and in search of which it had evidently dived at so unusual a distance from the surface. It is not, therefore, unnatural to surmise that the roots of the plants, finding within their immediate vicinity *all* the nutriment required for the plant whose mouths they are, quietly settle in that spot, and contentedly relinquish their erratic propensities.

VIII.

However plausible this and other objections may be, the best test, after all, is the test of experience; and that system, which I have called, for want of a better word, the incrustation of seeds, must live or die by that great test. A French gentleman has recently come to this country, to submit his invention of a machine for preparing the seed, and the formulas regulating the nature, proportions, and quantities of the mineral substances to be used, to the verdict of English practical farmers; and I am in a position to state that his appeal has been favourably received, and experiments are being made in various parts of England with the view of testing the value of that gentleman's discoveries. Messrs. Burgess and Key have been entrusted with the construction of the simple machine for the incrustation of the seed. This machine consists in a hollow cylinder, suspended by two leather straps from a pulley, to which a rotary motion of about forty revolutions in a minute is imparted, either from a steam engine or any other motive power. In the cylinder the seed is introduced, mixed with an agglutinous mixture, itself rich in nitrogen; and then the mineral substances, reduced to a fine powder, are added, and from the rotary motion of the cylinder adhere to the seed in a regular coating; this is repeated until the entire quantity has been fixed. In order to prevent the humidity of the agglutinous mixture from acting upon the seed, and causing it to germinate before it is put into the soil, an hygrometic substance is mixed with the mineral powders, which abstracts all the excess of humidity from the glue, and besides dries up the crusted seeds almost immediately.

Previous to his coming to this country, Mons. D'Illiers has satisfied himself by numerous experiments of the value of his discovery; and at the late sowing season, a large area has been sown with his prepared seed in various parts of France, so that at the time of next harvest I shall be enabled to give an authentic account of experiments tried both in France and in England, under every variety of local substances of soil, climate and modes of husbandry.—*Ib.*

Norwood, Jan. 8th, 1858.

From the British Farmers' Magazine.

The Culture of Sheep.

A Lecture by Mr. Robert Smith, of Emmett's Grange, South Molton, Devon.

On Monday evening, February 22, a lecture was delivered by Mr. Robert Smith, of Emmett's Grange, South Molton, Devon, in the new lecture-theatre of the South Kensington Museum, on "The Culture of Sheep," being the last of a series of six addresses to working men, and intended to explain the collections of the animal kingdom in the museum. The attendance was very large, there being at least 500 persons present. The lecturer produced a great number of pictorial sketches of the various breeds of sheep, English and foreign, which added materially to the interest of the lecture; they being frequently referred to in elucidation of the subject.

After some introductory observations—in which Mr. Smith spoke of the advantages offered to working men in that institution, and observed incidentally that in going over the museum he had found that the collection of specimens relative to the culture of sheep, was incomplete, and that he would do what he could to supply the deficiencies—the lecturer proceeded to bring before the audience the subject of his lecture. The culture of sheep was, he said, a branch of their rural and national economy which had not as yet received

that degree of public attention which was due to it. As a rural occupation it was the foundation of all good husbandry, and in a national point of view they looked to it as a means of employment for thousands of their artisans, and as an important source of food and raiment for an increasing population. They found from history that sheep had existed at the earliest periods in every quarter of the globe, from Iceland to the regions of the torrid zone; but they had been most cultivated in Europe —especially in Germany, Spain, and Great Britain; and not only had the cultivation of sheep in this country recently outstripped that of every other country, but they were daily witnessing a new and important auxiliary in the culture of sheep in the British colonies. As he had already intimated, sheep were found in every quarter of the globe. Thus they were to be met with in every variety of climate, adapting themselves to the vicissitudes of heat and cold. In each country they were cultivated according to the wants and tastes of the people, whether for food, clothing, or the uses of commerce; but when left to themselves, under the operation of Nature's laws, they represented every form of carcase and clothing which corresponded to or fitted them for the particular climate and country in which they existed. Sheep when in a wild state preferred to range at large on open plains, and displayed considerable sagacity in the selection of their food. They herded together in small flocks, and were in general active, swift of foot, and easily frightened by dogs or men. When completely domesticated, the sheep appeared as stupid as it was harmless; but when left to depend upon itself for food and protection, it exhibited a more decided character. Under such circumstances a ram had been seen to attack and beat off a formidable dog. On the approach of storms they retired for shelter to the spot which they knew from experience to be most adapted to afford it. Of all the domesticated animals of Great Britain, the sheep was of the greatest consequence both to the farmer and to the nation—to the farmer, because it was raised with ease and in situations where other animals could not exist, and generally made a better return for the quantity and quality of the food consumed than any other animal; to the nation, because it supplied a staple article of food and raiment, and at the same time afforded employment to an immense number of artisans. The culture of first-rate sheep was a "sci nce blended with practice;" and consequently a proper knowledge of Nature's laws, more especially as regarded the effect of climate and situation on their character had led to important improvements in their form, quality of flesh, and general management. It must not be forgotten that the sheep of the present day were, in fact, the production of man's skill and enterprise in their propagation from their original wild state. From this it might be inferred that were the breeders to relax their exertions, leaving the animal again to Nature's course, the various flocks would soon degenerate. Let them fancy for a moment such a state of things. Where then would be the advance of commerce or the increasing production of meat for an increasing population? Happily for the English nation, however, there was no cause to fear that this picture would ever become a reality. In every point of view "the culture of sheep" deserved to be esteemed one of the principal branches of rural economy, and claimed the attention of the artisan, the manufacturer, and the State. Now he must confess at the outset that he was not so familiar with foreign breeds of sheep as he was with English breeds; and therefore on that part of the subject he must call in the assistance of a very able work by Mr. Youatt. He should afterwards speak of what he himself was familiar with. The sheep which was handed down to us from time immemorial was a horned sheep. [The lecturer here referred to a picture of the original breed.] As he had before intimated, sheep were transformed in the process of propagation, by means of certain rules which were known to the breeders, and that the original breed should have been transformed into the sheep of the present day [pointing to specimens of the latter,] showed how great an art was the culture of sheep. He was indebted to Mr. Davis, the Queen's artist, of Church-street, Chelsea, for the paintings and pictorial specimens before them; and when he told them that gentleman had executed the whole of the sketches since 11 o'clock that morning, they must feel he had lost no time. After referring to a representation of the Russian sheep, the Wallachian she p, and the fat-rumped sheep, as affording illustrations of the original breed, and also to a picture of a black-faced Scotch sheep for the same purpose, he alluded to the fat-tailed sheep of the Cape, and remarked, in passing, that the tail of this sheep was esteemed so great a luxury in its native country, that it often sold for more than all the rest of the carcass. He then mentioned the Cyprus sheep, known by its spiral horns, and the Moufflon sheep, which inhabited Iceland, and resemble our deer. There were also the Asiatic argalia, the American argali, and more particularly the Merino sheep, of which he would speak at a future period of the lecture. Before he proceeded any further, he said, he ought to remark that the fine-woolled sheep were produced in dry warm countries; while strong-coated sheep were produced in wet cold countries; the coat being, in fact, adapted to the climate. From this it followed, that if the finest-wooled animals were introduced into this country, they would die away; while sheep of the opposite description might be expected to thrive. After illustrating and explaining the foreign breeds, their localities

and habits, (which was an interesting part of the lecture,) he would not trouble the audience with any further remarks on foreign sheep, but would proceed to speak of their own sheep. Of course England in the earliest periods of her history resembled all other countries under similar circumstances. There was nothing but bleak hills, undrained plains, and wild commons; and over these uncultivated lands were found no animals but such as were in a corresponding condition. But in the course of time desolation gave way to improvement; the hills and plains were cultivated, drainage was to a certain extent effected, and with the improvement of agriculture there was a corresponding improvement in the breeds of sheep. He would first speak of the native horned sheep as originally known in this country. That picture [pointing to one] represented the old black-faced mountain sheep of Yorkshire. That animal had disappeared before the plough, and the farmers of that part of England had placed on their lands a much better kind of animals. There, again, [pointing to another specimen,] was the Dorset long-woolled horned sheep. Generally speaking, all the inferior breeds had given way to the better breeds; but here was an exception—the Dorset sheep remained, and the reason of this was that the lambs were produced two or three months earlier by that breed of sheep than by any other. The inferior Dorset sheep were preserved in order that the luxurious might have lamb out of season. (laughter.) They had no doubt all heard a great deal about the Welsh sheep, [pointing to a sketch of this breed;] those sheep were fed on the waste hills of the Principality. If the hills could be cultivated, there would be a proportionate improvement in the breed of sheep; but as there appeared little prospect of that, the animal would no doubt continue in its present condition, and he need scarcely say that the Welsh sheep were altogether a naked lot (laughter.) He now came to the Old Norfolks, the sheep improved by the late Lord Leicester, better known in those days as Mr. Coke. When Lord Leicester first began his career as an agriculturist, in Norfolk, he found nothing but sandy downs and a race of hardy and inferior sheep; but now the sand downs had become fertile fields, and there was no part of the country which exhibited greater improvement, whether as regarded the cultivation of the land or the breeding of sheep. The sheep of which he had spoken had now disappeared, having been supplanted by the improved South Down of Sussex. Then as to the horned sheep. These were peculiar to the dry lands of England, it being on the moist pasture of the country that that description of animal did best. If the cultivator could get enough within five or six years from the wool and the price which he ultimately obtained for the carcase of his "old mountain wether," he was generally satisfied. He had now to refer to what were once the marshy districts of England, but which were now reckoned among the most fertile agricultural and grazing districts of the country; he referred especially to the Lincolnshire marshes. That county might be regarded as one of the best pasture districts in the kingdom. The sheep there were exposed to the Eastern winds, as they fed on the low grass lands; and consequently the animals which were most adapted for the district were robust animals—animals which had a large amount of bone and fleece. He was able to speak on this subject with greater confidence, because Lincolnshire happened to be his native county, and he resided there for a considerable portion of his life. The old Tees-Water sheep was almost a fac-simile of the Lincolnshire sheep. [The picture of both were referred to in support of this statement.] There [pointing to a picture of a group of sheep] was a representation of the Merino. It was a sketch made by Mr. Davis of some Merino sheep which were introduced into England by George the Third, with a view to their propagation. Notwithstanding the king's patronage, the farmers of the day would not have these foreign sheep thrust upon them; the carcase not being one that would pay, and almost the sole use of the animal being the production of fine wool, to be mixed with the coarser wools. There was a fac-simile of this breed of sheep on Exmoor Forest; and this suggested to him that though the Spaniard had propagated this animal chiefly for his wool, it might have come originally from the mountain. The Merino was a very hardy animal, its wool was remarkably thick and fine, and it was altogether a very respectable sheep, (laughter.) It had occurred to him that the Exmoor sheep might be mixed with the Merino to advantage; not that English farmers would consent to admit the Merino in order to improve their own sheep; but he thought their sheep would improve the Merino, by giving them more lean meat and length of wool. There [pointing to a picture] was a brown animal called "the Syrian sheep," which was a sort of Cape sheep with a long tail. This reminded him of a very interesting fact, namely, that the sheep of the earliest ages, besides being horned, were in many cases coloured. In tracing the records of history, relating to this subject, he found mention made of black sheep, brown sheep, speckled sheep, mottled sheep, and so on. So also in the present day, agriculturists sometimes saw among their flocks black sheep, grey-faced sheep, grey-legged sheep; while there was also an occasional appearance of horns. Now he felt that he had not said enough about the Merino sheep. The Spaniards and the Germans had propagated the Merino on account of the fineness of its wool. It is this kind of sheep that has been found to be most suitable for our Australian colonies. The Southdown sheep had been

tried there, but had not been found to answer so well, because it was, in fact, a wild mountain sheep. In Australia, land being for the most part of little value, and rents merely nominal, an immense quantity of sheep were kept ranging over vast tracts of country; and up to a recent period, if the shearing from time to time fulfilled the expectations of the grower, he was amply repaid. Since the discovery of the gold diggings, however, and the vast increase of population, there had, of course, been people to feed as well as fine wools to be produced. In fact the people of Australia had already found themselves rather in a dilemma for want of mutton; and it might be worthy of consideration whether it would not pay some Australian agriculturists to come over here, and pay him (the lecturer) a good price for specimens of his mountain Exmoor sheep, (laughter.) Now among the old English breeds that remain, there was the Dorset sheep, which was preserved, as he had stated, on account of the early lamb; the Welsh sheep, which did not appear at all likely to be improved; and the Scotch black-faced sheep. This last sheep resembled the Russian sheep, and belonged, no doubt, to the same family. It was a very useful animal, chiefly for this reason, that it lived and throve where no other breed of sheep could do so. Then there was the Exmoor sheep, which he begged to say had not disappeared, (laughter,) but, on the contrary, was as thriving as ever. Next, there was the old Scotch white-faced horn, which, in consequence of the improvement of the black-faced sheep, and the very rapid march of the Cheviot sheep, was altogether out of date. Then there were the old Ryelands, natives of Worcestershire, Herefordshire, &c. On this subject he remarked, that it was not unlikely that the late Mr. Bakewell received considerable aid from the Ryeland sheep. Mr. Bakewell never explained to English breeders the course which he pursued, as they could have wished him to do, by leaving a legacy to future generations the descriptive art of producing such a newly established breed as *his* Leicesters. He thought he obtained them originally from the Ryelands sheep. In fact [pointing to pictorial sketches of Ryeland and Leicester sheep] there we have the portrait of a Ryeland ewe, and another of a Leicester, as first improved by Mr. Bakewell. I must say, I think them so alike, that I was about to say I see no difference. A representation of one of Mr. Bakewell's sort of sheep was given in the *Farmers' Magazine*, published by Messrs. Rogerson and Tuxford, of the Strand. Many breeders thought that animal—a ram bred by Mr. Inskip—an exceedingly good one, and many ventured to assert that there never was so good an animal before, and never would be so good a one again. Mr. Bakewell produced a particular kind of animal—an animal suited to his own particular taste. At the outset he bred his sheep for form and symmetry, quality of flesh, fineness of wool, but regardless of weight. After a few years, when he had arrived at a certain state of cultivation, however much he might be admired by his friends the Leicester breeders, there were others who did not view the matter in the same light. These persons did not feel that the head required to be made smart, or the wool fine, or the bone less; they therefore resisted the new theories, and, as is stated by Mr. Youatt in his book, Mr. Bakewell was at first unsuccessful in the letting his sheep; but in after years it happened that men's minds began to change: lest the whole cultivation should be monopolized by that gentleman, a society consisting of eight breeders was formed to obtain the first pick of his flock. In the fall of the year each of these gentlemen selected a male animal, so that Mr. Bakewell's sheep were distributed as it were over the country. There was another breed of sheep which he had not mentioned, namely, the Romney Marsh sheep. This was a wild, bony, coarse animal, and he believed it had disappeared. There was another sheep, of an intermediate character, called the Devonshire Nots, a variety between the Exmoor horned sheep and the Leicester, and a very hardy animal. This was found among the high hills of North Devon and West Somerset: it was an animal which was about half way between the highly-cultivated sheep and the mountain races, and, occupying an intermediate position, was exceedingly useful in certain districts of the country. He now came to the short-wooled sheep. A black-faced, short-woolled sheep was found scattered over a great many of the Southern countries. Here, for example, [pointing to a specimen,] was a black Norfolk sheep. This afforded an illustration of what he had said before with regard to the influence of climate. Here they had changed the Old Norfolk for the Southdown sheep in the dry Eastern counties of England. Then they had the Southdown on the dry Southern soils, and distributed over many intermediate spaces of dry and healthy sheep-lands—which the lecturer explained, grounding every argument upon climate and improved cultivation. The Leicester inhabit the midland counties and intermediate lands between the extreme dry and extreme moist climates of our island, the long-woolled sheep being exposed to the colder aspects, where the short-wool or pure Leicester could not exist. The localities and habits of the several breeds were then enumerated by reference to a map of England and Wales, which had been prepared by the authorities of the Institution for the purpose of illustrating the lecture. In turning to Scotland, he would remark that such was the effect of altitude that he would illustrate it in this way, by reference to a hilly district: for instance, at the foot of the hill was to be found the cultivated Leicesters, then the

mixed Leicester and Cheviot, a stage further up they found the Cheviot sheep, then the mixed black-faced and Cheviot cross, and next we find the black-faced ewe, and lastly the black-faced wethers, which it was said no weather could destroy, unless blown over by a tempestuous gale, (laughter.) Tracing the course of the different breeds on the map, he observed that they had here long-wools, middle-wools, and short-wools. The long-wools were to be found in Lincolnshire, Yorkshire, Kent, the Cotswold-hills, and some parts of the midland counties; the middle-wools were to be found in Dorsetshire Devonshire, Leicester, Rutland, Nottingham, &c.; while among the short-wools were the very popular Southdowns, West Country-downs, Norfolk-downs, Hampshire-downs, and Shropshires. The latter breed, he might observe, had come very rapidly into public favour, and he must confess that as an old breeder he was astonished to find them cultivated to so high a pitch, and carrying off, as they had done, prizes at our national shows. In like manner (and this is extremely interesting) there was now a new breed of sheep, called the Oxford-downs. Thus, it would be observed, were agriculturists in various districts endeavouring to propagate sheep which were peculiarly adapted to the climate and situations of their several districts. This was very important as bearing on the state of the sheep culture at the present day. The truth was that there had been eminent breeders of sheep as well as eminent men in other departments of industry; we have had our Ellman, Grantham, Bakewell, Collings, Culley, the late Duke of Bedford, Lord Spencer, Lord Leicester, &c., of the past age, who did their duty in thus handing down to us our present established breeds—breeds that have been cultivated from these indigenuous and mountain races here, [pointing to the pictorial sketches.] This stage of improvement was received by men of the present generation, who have succeeded to admiration in carrying on the great work of art by propagation. Our country stands indebted to such men as Jonas Webb, the Duke of Richmond, Overman, Sainsbury, Rigden, Grantham, &c., for cultivating the South-down; to Sandy, Pawlett, Creswell, Turner, Spencer, and others for the Leicesters; while the long-wools have been remoddled by the Clarkes, Kirkhams, Casswells, Richardsons, Brices, &c., in Lincolnshire; and by Large, Hewer, Garne, Wells, Handy, Brown, and Ruck, on the Cotswold and neighbouring hills. There are many other breeders who had long directed special attention to the improvement of their breeds of sheep; and, looking at the transformations which had been effected, [here the lecturer pointed to the original and the improved breeds represented in the pictures,] he must say, that if credit was due to improvers in other departments of art and of industry, equal credit was due to the breeders of sheep for the ingenuity and talent which they had displayed in their vocation, (cheers.) Much of the improvement was due to the Royal Agricultural Society, which had offered prizes for the best specimens of sheep. But let it be remembered, that Mr. Ellman took in hand the improvement of the South-downs about a hundred years ago; and Lord Leicester, Mr. Bakewell, and some few others, achieved immense success before numbers were at all aware what they were doing. This, of course, had a close bearing on the production of the established breeds of the present day, early corrections being thus early stamped by their males. It must not be supposed that the race of attempted improvement was all sunshine. He could give the names of a dozen or perhaps twenty breeders who had not succeeded, especially in the breeding of rams. It was no easy matter to blend science with practice. He had already mentioned the failure of the attempt made by George the Third to introduce Merino sheep into this country; and he had recently learned, from the published report of an Australian agricultural body, that its sheep-breeding operations had proved by no means satisfactory. He then proceeded to speak more particularly of the *breeding* of sheep. Adverting to what he had said about the early lambing of the Dorset sheep, he remarked that lambs were dropped according to the uses and requirements of the several counties, as regards climate, food, and after-management to be pursued for realizing in the markets, and at what age they were to be sold. The mountain races, of course, did not drop their lambs until the cold season was gone by, so that the lambs could eat the early grasses as they sprang up. He had not yet referred to the Cotswold sheep, which was a magnificent animal; [pointing to a portrait, he said, That is a draught of a Cotswold ram, belonging to Mr. Lane, which took the first prize at the Lewes Meeting.] After giving some local details of this breed, he stated that the lambing of this sheep occurred about March; so also did that of the Leicester sheep; but he might say again that the period generally depends on situation, climate, and the supply of food. One important fact was, that at the present time sheep were, in some of the best districts, sent to market at the early age of twelve, fifteen, or eighteen months. Formerly, scarcely any sheep were sent under three or four year of age; and therefore the public had to wait for their mutton, (laughter.) The truth was that in many grazing counties it was formerly, and even now, difficult to provide food for fattening them in the winter season: hence, the farmer fed his sheep on the richest pastures he could give them during the summer months, in order that he might be able to send them early to market in the autumn. Another very important matter in relation to the culture of sheep was warmth. He had before referred to this.

in effect, in speaking of climate; but the subject of warmth was so important as to require special mention. On this point he would read an extract from a lecture which was delivered by Dr. Lyon Playfair before the members of the Royal Agricultural Society, in the year 1842, the subject of the lecture being, "The application of physiology to the rearing and breeding of cattle." He must confess that, as a farmer and breeder, he listened to the lecture at the time, as no doubt many others did, with a predisposition to set down everything as mere theory; but subsequent experience had convinced him that what the doctor said was true. Dr. Playfair set out by saying, "It would be presumptuous in any scientific man, however exalted his rank in science, to endeavour to instruct an assemblage such as this, or to recommend illustrations in the practice of an art which he has learned in the closet and not in the field." He must say that that was his feeling at the moment. "But it may be permitted," added the doctor, "even to the most humble cultivator of science, to examine the practice which you yourselves have perfected, and to point out the laws of nature upon which that practice depends." Dr. Playfair afterwards went on to tell them, in regard to warmth, that it was up to a certain point an equivalent for food. He said, "The average temperature of the bodies of our cattle is about 100 degrees, or more than 40 degrees higher than the ordinary temperature of this climate. Hence there must be some provision in the animal body to sustain the heat which is absolutely necessary for the performance of the organic functions. The air, being so much colder than the body, must constantly withdraw from it heat, and tend to lower its temperature. Whence, then, comes the fuel for the production of the heat?" What the doctor said was, in other words, that the heat required by the animal's body being 100 degrees, when the temperature was below that the exchanges were against the animal. If the bodily heat was only 60, it must be made up to 100 by fuel. What fuel? Why, food. Surely, then, breeders ought, for the sake of economy, to keep up the animal heat. The doctor quoted Liebig in confirmation of his views. "Were we," said Liebig, "to go naked like certain savage tribes, or if in hunting and fishing we were exposed to the same degree of cold as the Samoyedes, we should be able with ease to consume ten pounds of flesh, and perhaps a dozen of tallow candles into the bargain, as warmly clad travellers have related with astonishment of these people. We should then also be able to take the same quantity of brandy or train-oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the temperature of the external air and that of our bodies." Dr. Playfair himself afterwards said: "The only use of clothes, in the abstract, is to economize food. They assist in retaining the heat of the body, and render less food or fuel necessary for this purpose." To this he (the lecturer) would add another illustration. If a man who had led an active life, and had been accustomed to exposure to cold, retired from business, and confined himself almost entirely to a warm room, he would get fat, simply because there would be nothing to lower the animal heat. After the publication of Dr. Playfair's lecture, in 1842, a prize was offered by the Royal Agricultural Society for the best essay on the management of sheep. He was himself fortunate enough to be the successful competitor; and at the end of the essay, which was published in the eighth volume of the Society's Transactions, would be found the results of twenty experiments which he tried in animal-feeding, which confirmed Dr. Playfair's views in reference to warmth. He would not trouble them by entering into any of the details of the experiments, but he would observe that the experiments all hinged upon the relative value of the different kinds of food which were given to animals. For instance, there was a comparison between the common white turnip and the swede turnip. They all knew that the common white turnip contained a very large quantity of water. In September, while the sun was still powerful, he found that the sheep would thrive very well on a given quantity of that vegetable; but when the sun's rays had become more oblique, and the temperature of the atmosphere was considerably lower, so that as the animal inhaled the surrounding air the exchanges were against it, he found that the animals fed on the white turnip made no progress; the fact being that such food did nothing but just suffice to keep up the animal heat. At this period, however, that was about Christmas, came in the swede, which contained a smaller proportion of water. Less of this was required to keep up the bodily temperature, and with care on the part of the farmer, the animal went on pretty well till the spring, when there was no longer any difficulty. He might further observe, that he put eight sheep in summer into two pens, four in each pen, and besides giving them all clover, he supplied one pen with a pint of beans per day, and the other with a pint of peas. It might be supposed that there would be little difference between the two as the result of this variation of diet; whereas in fact, the sheep supplied with the peas did very well; while those that had the beans, like horses that were overfed with the same kind of food, soon exhibited symptoms of inflamation, the beans being too hot for the body at that period of the year. At the conclusion of his essay he said, "Thus, after many anxious reflections upon the '*principle*' which 'science' has dictated, 'practice' has shown it to be one of great magnitude, and to develop the mysteries of past ages by pointing

out those elements of the vegetable creation best adapted to Nature's laws under the varied temperature of the seasons." While he advocated warmth, he was very far from saying that animals should be shut up in places where the atmosphere was at 100 degrees, or where there was no adequate provision for ventilation. What he wished to point out was, that warmth had an important and necessary connection with the food which was given to animals. Having now said enough with regard to the breeding of sheep, he would say a few words with regard to sheep required as food for man. There was no other animal so important in this point of view as the sheep. Mutton constituted the grand staple food of this country; and hence, as he had before remarked, the improvement of the breeds had a close connection with the increase of population. The Royal Agricultural Society and the Smithfield Club had both exerted themselves in the field of improvement, by offering prizes and holding exhibitions periodically; and great success had attended their efforts. Similar exhibitions had recently taken place in France; but the result thus far was that the English breeders and graziers who exhibited sheep swept away the prizes, and, pocketing the money, walked away with it, (laughter.) As regarded the distribution of the meat, some preferred early lamb, and others preferred saddle of mutton with a black foot, and had to pay for the luxury; while others, again, having less money to spare, made a different choice. The whole thing was beautifully arranged, and the culture harmonized with the variety in the public demands. Having been at Smithfield market early on Monday morning, he had observed that the butchers from the West End had the first choice of the market; then come the purveyors for the mass of the middle classes; and, last of all, came those whose business lay chiefly with the working classes, and who said they must have a great lot of meat for their money, (laughter.) A very remarkable alteration had taken place of late years with regard to the conveyance of sheep to market, and the return to the seller. When he was a lad, living in Lincolnshire, his father's sheep and capital were a fortnight walking to the metropolis, and they each lost eight or ten pounds' weight of meat on the way. Of course no one got the meat that was expended on the route—it was so much absolute waste. Now, sheep were conveyed from Lincolnshire to London in a few hours, and within thirty hours after they left the farm the animals were not only sold, but the farmer or dealer had his money for them, and could thus employ it at once. This was a very great improvement; in fact, one of the great facilities afforded by the railways. It was not necessary that he should say anything with regard to the dead meat markets, as they were all familiar with them. Here, again, however, was a comparatively new state of things. Meat was now brought from Scotland and other distant parts of the kingdom, which did not come formerly; and rapidly as people from various districts had located themselves in the metropolis, the supply of meat had followed them in the same ratio. The use of artificial manures had a close and interesting connection with this subject. By using such articles the farmer was enabled greatly to increase his growth of turnips, and before it was necessary for him to pay for the manures, he had an ample return in the extra quantity of sheep which he was thus enabled to keep and send to market. He must now conclude. He had told the commissioners that it was quite impossible for him, within a single lecture, to exhaust the whole question of the culture of sheep. The wool production he had not yet touched, and he believed it was to be entered upon by a gentleman from the North of England familiar with manufactures, who would take up the subject where he (Mr. Smith) had left it. The wool collection in the museum was by no means complete; and as he had before intimated, he should, after his return home, do everything that might be in his power to supply the defects. The great importance of sheep, in relation to their wool-bearing properties, was daily increasing. Beyond our own growth the imports of wool from Australia, in 1807, amounted to only 245 lbs.; whereas in 1855, the latest period up to which the returns extended, the importation was 40,810,137 lbs. In 1833 we received from India 3,72 lbs., in 1855, 4,594,520 lbs. The total imports of wool from all places, in 1855, amounted to 99,300,446 lbs.

The lecture occupied one hour and three-quarters, the whole of which being given from notes, made it the more interesting to the audience. The lecturer concluded by thanking the audience for the patience with which they had listened to him, and on retiring he was loudly cheered.

From Hunt's Merchants' Magazine.

The Guano Trade a Monopoly.

As a convention of the Peruvian Legislature is now sitting at Lima, as to the future disposal of guano, whether it is to be continued as a monopoly in the hands of the present consignees, Messrs. Baneda Brothers for the United States, Anthony Gibbs and Son for Great Britain, and the agent for France and the continent, or opened for free sale at the islands. it may be interesting to know a little of the trade and of the immense profits made by the consignees. The shipments to this country and England for 1854, being in round numbers 163,000 and 200,000 (those to the continent not included,) will show the great interest the consignees have in continuing things as they are, and the necessity of our citizens and

the English exerting themselves to open the trade to the public:—

SOLD IN THE STATES IN 1854.

	dolls.
163,000 tons at 55 d., 8,965,000 d.; com. per cent.,	448,250
163,000 freight 20 d., 3,260,000 d.; com. 2½ per cent.,	81,500
The consignees get this on all charters, no matter how many ship-brokers are interested in the other half.	
Estimating 163 vessels as loaded, and that 3,000 ds. were drawn from disbursement, the profits on advances of Peruvian dollars, worth about 75 c.,	125,000
	654,750
Messrs A. Gibbs and Son, in proportion, would amount to,	813,000
There are other commissions on advances, storage, &c.	

Memorials have been presented by the British landowners, farmers, shipowners, and merchants to the government, to use their influence to have the monopoly so injurious to the public good done away with; but hitherto their exertions with the Peruvian government have been unsuccessful. However, there is now a hope, as the Peruvians think a change ought to be made. The ministers of both countries should render their assistance for so desirable an object.

Though freights have fallen considerably since 1854, the price of guano has been raised from 55 dols. to 62 dols.

When at the Chincha Islands a few years ago, Mr. Elias had the contract for shipping, at nearly a dollar over the tender of Mr. Lloyd, though backed with good security. This would be a charge extra of 400,000 dols. a-year to the farmers, estimating the annual shipments at that amount. The vessels were then delayed a month, by having to enter and clear at Callao.

In 1851 the price of guano, with higher freights than at present, was 45 dols. This year the English agents attempted to raise the price to 70 dols., being 8 dols. over the rates here, though the chrges were the same; but it failed, owing to the *Mark Lane Express* calling the attention of the farmers and the trade to its injustice. 500,000 tons could be annually shipped from the islands, which, at 20 dols., would give a revenue to Peru of 10,000,000 dols. (less the shipping charges,) and with 20 dols. freight would make guano stand 40 dols. afloat, instead of 60 dols., as under present management.

This is a question of importance to the farmers of the world.

For the Planter.

The Honey Bee and its Products.

The deplorable want of knowledge on the subject of the Honey Bee, its instincts and management, is scarcely to be imagined, unless by those who have made the insect their peculiar study.

Agricultural societies, as a general thing, have acted upon the assumption that Bee-keeping and honey-raising could not be profitably conducted upon a large scale, and are deserving of a *limited* encouragement only as a mere accessory to other means of domestic comfort. But let it be once known and appreciated that millions of pounds of honey are wasted annually at our very doors, solely for the want of information being diffused on the subject, and it rises at once to the dignity of an important element of agricultural profit and of national wealth, as well as of domestic luxury. To aid as far as I can in disseminating correct knowledge on the subject, I write the following observations. I am unable for want of time to prepare as full an article as its great importance to the agriculturist merits, yet even a hasty and imperfect treatise may impart to him information which may be both new and valuable to him, and which I take great pleasure in communicating for his instruction. The first point which I shall discuss is the BEE-MOTH,—how to prevent its ravages, &c.

With hives of a proper construction and a knowledge of the habits of this most terrible enemy of the Bee, I feel warranted in asserting that there need not ever be lost one more stock of Bees. My limits and time will not allow of a minute description of the moth, which is scarcely necessary, as every Bee-keeper knows it on sight. The moth always (except as hereinafter described) deposits its eggs in the propolis or Bee-glue with which the interior of the hive is lined, or covered by the Bees, the natural heat of their bodies being sufficient to keep it soft. If instead of permitting the Bees to waste their time in gathering and spreading this substance the owner would take Beeswax and rosin, one-third of the former and two-thirds of the latter, and melt them together, and with a brush apply the mixture evenly on the interior of the hive, he would render it absolutely moth-proof, with but two ex-

ceptions. After the operation above detailed is performed, it would be impossible for the moth after entering (for they can *enter* any hive or place the Bee can) to insert her ovipositor or egg-layer into the artificial propolis,—in which case she must necessarily leave the hive without accomplishing her felonious design. One of the exceptions above referred to, is where the hive has overswarmed itself, and left a portion of the comb unprotected, in which case the moth will experience no opposition whatever in her design of destroying the hive. When this is the state of the hive, particularly in the common or box hive, also nearly all the patent hives I have yet examined, there is but one remedy, which is to close the entrance of the hive allowing space sufficient for only one Bee to pass in or out at a time; in which situation the colony can and will protect themselves. It is manifest the smaller the entrance to the hive the easier it is protected. If the Apiarian uses a hive in which he has at all times the entire and absolute control of the comb, he may remove all the unprotected combs and deposit them in the house or other secure and dry place. When the Bees have increased in numbers sufficient, the combs may be returned to the hive.

The remaining exception is, when the queen has died with old age or by accident. In this case, unless at the time of her death there was an egg in the worker-brood comb under four days old, the colony is irretrievably lost. It is a well demonstrated fact that of any egg of the kind mentioned, the Bees can make a queen in sixteen days from the time it was laid. The only remedy in this case the Apiarian has, is to procure a piece of comb containing young or fresh laid eggs, and thrusting it gently into the interior of his hive, he will readily perceive the eggs at the bottom of the cells; they are distinguished by being of a white or pale blue cast; they are about 1-32nd of an inch in length, slightly curved, which is caused by the manner in which they are deposited by the queen. After the comb with the eggs is placed in the hive, an observer will find that before, or at least by the time the operation is completed, the Bees will depart to their labours precisely the same as if they had always been in the enjoyment of a queen. It will further be noticed, that in four minutes or less the Bees will arrive at the entrance of the hive with pollen or Bee-bread on their thighs.

The colony is now able to repel the attacks of their enemy, the moth, unless they have already become so reduced in numbers as to be unable to defend all their combs, in which case the entrance must be partially closed as above mentioned The Apiarian will again perceive that to perform the above operation properly, it is absolutely necessary he should have command of the combs. An infallible guide to ascertain when the queen is lost is as follows: On examining or standing in front of the hive, if there is no pollen being carried in on the thighs of the Bees, it is certain she is lost or dead. There are several other methods of ascertaining her loss, but the above being the easiest and quickest it will hardly be necessary to particularize in this hasty scrawl.

It will be necessary for me, at least partially, to explain the process of queen-making. The egg which is selected by the Bees for that purpose is always found in the worker-comb; three cells are gnawed into one, two eggs removed, the remaining egg is treated after hatching into a worm, with a peculiar food styled by Apiarians the *royal jelly*. In sixteen days from the time the egg was deposited, the hive will be in possession of a queen. I may be allowed to remark in this connection, that writers for over two thousand years have been endeavouring to ascertain the manner in which the royal jelly is procured, &c., but in no case have they succeeded. I claim that I have discovered the particulars of its production, but hesitate in giving my discovery to the world until I have instituted a more thorough course of experiments. My object in mentioning the subject in this connection is that I may place on record the fact of the discovery being made.

It is within the experience of all scientific Bee-keepers, in fact within the knowledge of most others, that when a hive is composed of a series of boxes or separate apartments, or it contains cracks or crevices, or wherever two plain surfaces meet, it matters not how close they come together, the principle of Bee-keeping is

lost. In a hive properly constructed there should not be one square inch of the interior but which may be searched into and examined by the Bees. If in any of the places to which the Bees have not free access even a crack or a crevice can be found into which not even the edge of a sheet of paper can be inserted, the worm can and will penetrate. After so doing it will gnaw itself a place sufficiently capacious to wind up its cocoon, hatch in security, pass out of the hive, become impregnated, re-enter only to repeat the process, until finally by outnumbering the Bees they take and keep possession of the entire hive, and destroy its contents.

I could name many patent hives now very extensively introduced, by which it would appear the principal object the inventors had in view was to contrive the best accommodations for the insect they so much dread. From these few remarks the Bee-keeper must again see that to be successful he must have a hive in which there is not a square inch but he or the Bees have access to at all times.

I come now to speak in the second place of *drones*. The drones are the males. It is ascertained that a few answer all purposes fully as well as if the hive contained a few or many thousand. To the writer belongs exclusively the discovery that they consume fully one-half of all the honey gathered by the working Bees in the world. I will show how this immense amount of honey may be saved. It will be necessary first to show the manner and where the drones are hatched, &c. They are twenty-five days in coming to maturity from the time the eggs are deposited. If the owner will observe, he will find there are two classes or sizes of combs. One class is termed drone comb, the other worker comb; besides which there is an intermediate classs styled store comb. In the drone comb the cells are four to the inch or thirty-two cells to the square inch, or 4,608 cells to the square foot. In the worker comb it will be found there are five cells to the inch, fifty to the square inch, or 7,200 to the square foot. According to my observation the average quantity of drone comb in hives throughout the country is over one foot. In some instances I have taken over six feet out of one hive, which was capable at one hatching of raising over 27,000 drones

That the Apiarian may have occular demonstration of the immense amount of honey the drones consume, it is required he should station himself in front of a hive, in the summer season when they are the most abundant. Catch them as they pass out, (they have no stings,) tear into halves, press the hinder part, and a large drop of the finest quality of honey will be observed. The examination may be continued for hours, and not one drone passing out will be found without a load. On the contrary, catch them as they enter, and not a drone will be found to contain a particle of honey. This operation will prove to the satisfaction of experimentors, that the drones consume an immense amount of honey, and that they produce none.

To render the experiment more interesting and convincing, let the observer sprinkle a few particles of flour on a drone leaving the hive, then, with watch in hand, observe his return; kill him that the mark may be obliterated,—and so continue the operation until a sufficient number have passed out and returned; by averaging the time they run out, he may arrive at a very fair calculation of the amount of honey they consume in a given number of hours. If a closer calculation is necessary, let the Apiarian weigh in a fine balance, say 20 or 50 drones, killed as they pass out, and a like number destroyed as they return; the difference in the weight will determine the amount of honey consumed in the number of minutes he has before ascertained they are absent.

Every Apiarian, upon instituting the above experiments will at once see that my assertion of the drones consuming at least one-half of all the honey collected by the workers throughout the world is no exaggeration.

Now, as a few drones answer all the purposes required as well as if they numbered many thousands the great object of the Bee-keeper should be to get rid of them,—not after they are hatched, but prevent their being brought into existence at all. There is but one plan by which this can be accomplished, which is to cut out the combs containing the cells in which they are hatch. This is a difficult matter in the common or box hive, and an impos-

sibility in nearly all patent hives; therefore it follows, that in addition to the patent hives being calculated, as it is seen, to breed the moth, they are also drone-breeders.

The advantages of cutting out the combs referred to are of such magnitude, that I may be allowed to show them more fully than I have done. The Bee-keeper makes a saving of all the honey fed to them before they are matured; the time occupied by the Bees in feeding and nursing them is saved; and last, though not least, assuming one foot as the average which is capable of producing over 4000 drones, as before mentioned, by destroying this there is space sufficient to build combs in which 7,200 cells for hatching the workers will be erected; which, as we have done away with the drones, is fully equal to an accession of 14,400 working Bees. To illustrate this matter properly, and to show the absolute reasons why there are in some hives less, and in others more drone combs, would require a small volume. Once more. The Bee-keeper will be reminded that to perform the operation of cutting out the drone combs, he must have a hive so constructed that access to each and all the combs can be had at all times.

Tons upon tons of Beeswax are annually brought to our markets. Is the Bee-keeper aware that at least twenty pounds of honey must be and always is consumed in the construction of one pound of comb. This is a well ascertained fact and as fully demonstrated as any problem in Euclid. Every pound of worker brood comb that can be saved is a gain of twenty pounds of honey and the time occupied by the Bees in producing it; but the Apiarian cannot avail himself of this great advantage in any of the common hives or patent hives in use unless it is so constructed that he has the absolute command of the interior, which none of these admits of so far as is known to the writer, excepting Rev. L. L. Langstroth's Movable Comb Hive. The combs are built in frames similar to a slate or picture in a frame, which being suspended on a narrow rabbet, do not touch or come in contact with the hive at the top, bottom or sides. Old combs can be put into the frames and be given to the Bees, to fill for their own use or for breeding combs.

To illustrate the great advantage of saving combs from ordinary hives which have died in the winter or otherwise, I will give one exemplification and pass on to the next subject. Suppose a small swarm to come off late in the season; if hived in the ordinary hive it will not increase in numbers sufficient to collect from the fall crop of honey a store to last them until spring, for they must consume near twenty pounds of their gatherings to elaborate wax sufficient to manufacture combs enough to contain honey to last them through the winter. Now, if the same swarm is placed in a hive into which we have introduced one pound of comb, they will store up a supply abundantly sufficient for their necessities, and increase in numbers to an extent incredible to all who have not witnessed the fact. This subject, to have justice done it, would occupy more space than my whole article contains.

3rdly. The next matter that claims the attention of the Bee-keeper is—Can a country similar to ours be overstocked with Bees? My answer is, it is scarcely possible it will ever be done. There is in Russia one apiary containing over 8000 large hives: in Poland, Prussia and Germany many apiaries contain from hundreds to one, two, three, and four thousand hives, all of which give large returns. My own experience goes to establish the fact of the great capacity of our country for honey raising. Three years since I had only ten hives; my neighbours had none. At this time I have over one hundred; many of my immediate neighbours also have a number of hives. I discover no difference in my yield of honey now from what it was when my stock was small. My apiary will contain at least 1000 colonies in the coming season; the result will be the same as if I had but ten colonies. I will here remark that many of my hives gave me a net yield of over 100 pounds of honey, leaving more than double the quantity sufficient to maintain the Bees until the ensuing season in the main body of the hive. This result is to be principally attributed to the fact of the drone combs being removed at the commencement of the season.

In the province of Lunenburg, Kingdom of Hanover,—a territory designated by agricultural writers the "*Desert of Ger-*

many"—the product of the Bees in the aggregate is more than sufficient to pay all classes of taxes; and in fact it is notorious that the inhabitants are the most happily situated, so far as pecuniary affairs are concerned, of any other equal population in Europe, which is solely to be attributed to the habits of economy, thrift, and industry, induced by the culture of the Bee.

By the most recent statistics, it is ascertained there is in the aggregate on each and every square mile 142 hives of Bees. There are but few miles in this country as heavily stocked as this; but will any Apiarian, who has given the subject his attention, say that our country, and more particularly the State of Virginia, cannot support this number of colonies? It can, and the time is approaching when the assertion will be proven by actual demonstration. Virginia contains 61,212 square miles. To show what might be done by the agriculturist, let us make a calculation: Reducing the European estimate to 100 to the mile, the result would be 6,121,200 hives of Bees. Still continuing our reduced estimate, allowing only twenty pounds to each hive, we have as a result 122,324,000 pounds of honey, which, at 10 cts., (about one-third the present price of a good article at the North,) we have a result in dollars and cents of $12,242,400. Is it not absurd in any people to throw away and reject, as it were, this magnificent sum? Is there a home market for this product? Yes, and for double the quantity. I have no opportunity of estimating the quantity nor value of the sugar and molases imported,—but let the ladies hereafter put up their preserves in honey, and my word for it, sugar for that purpose will, after trial, be rejected. Honey adds greatly to the flavour of tea, —coffee the same. After a few trials none will desire to return to the sugar. Nearly every purpose for which sugar is used honey can and will be substituted in its place. The prosperity of a State is not to be estimated by the amount of money introduced into it. The true plan is, to calculate from the quantity that may be retained in it by the consumption of articles produced within its own borders. But I must conclude.

If the reader desires further information, I refer him to the second edition of the scientific work of the Rev. L. L. Langstroth, of Philadelphia, who, after devoting nineteen years to observations on and experiments with the Bee, has recorded the results in a book of 500 pages, illustrated with engravings,—which is, in my estimation, worthy to be commended to the careful perusal of all who desire to obtain more full and accurate information.

P. J. MAHAN.

Philadelphia.

For the Planter.

The Tobacco Exchange.

Editor So. Planter:—Will you do me the favour to publish in the Planter the resolutions of the *planter's very kind friends* who have lately established the Tobacco Exchange in the city of Richmond; and, along with the resolutions, publish also the working of similar establishments in the cities of New York, Baltimore and New Orleans?

I understand that in New York no one *now* is allowed to enter the warehouses when tobacco is inspected but the inspectors and the hands necessarily employed in the inspection. How it works in Baltimore I have not heard. In New Orleans I understand that the Planter is not allowed to sell his cotton or tobacco except by a factor or commission merchant. Are these things so? If not, how do such establishments work in the cities above mentioned? Your journal professes to be the friend of the planter and yet I have seen nothing in your paper in reference to this late innovation, instituted by our kind friends, the Commission Merchants in Richmond, upon the long and well-established usage in the sale of our Tobacco. Let us see how such establishments work elsewhere.

A Buckingham Planter.

[In response to the request and enquiries of our Buckingham friend, we publish the following article on the tobacco trade, obligingly furnished us by one of the oldest and most intelligent of our merchants. He has long since retired from business and is, as he signs himself, a "disinterested looker on." The resolutions of the

merchants regulating the exchange will follow his communication.—Editor]

Wherever a large business is done in any one article of commerce the concentration of it at one Emporium of trade and at one spot in that Emporium, has beyond doubt, been found most beneficial to both seller and purchaser. This is evident from the experience of all countries that have tried it. All competition is concentrated. The seller knows that whatever may be the quality of his article, among all the dealers in it collected together, some will be found whose purposes it suits, however objectionable the quality may be, although it might be very difficult to find a purchaser, if he had to be sought for. If the quality of his article be very desirable, it is seen by every buyer in the market when it is offered for sale at a central spot and all possible competition is enlisted in its favor.

There is no doubt that the excessive fatigue and loss of time that has been attendant on the system of selling Tobacco at several Warehouses remote from each other amid sweltering heat and dust at uncertain hours and occupying nearly a whole summer's day, has deterred some capitalists from sacrificing their time and health by taking the rounds of the Warehouses, and even were they disposed to do so, it required an iron constitution to stand the fatigue and annoyance; whereas, by a concentration of all the samples at one spot, they can be looked over before the sale commences and each purchaser can decide for what samples to bid, when the regular hour for selling arrives. No partiality can be shown as to precedence, &c., where the Crier is to derive no benefit beyond his regular fees, and the abuse of his office is not likely to be exercised if he is held strictly to the performance of his appropriate duties. The practice of converting an Inspector into a Commission Merchant has been a gradually increasing abuse, until in some instances he became a sort of Banker—loaning out or otherwise using the money of a confiding planter, or advancing his money to a needy one, and one instance at least is reported to have occurred, where the money was never forthcoming, and both money and Inspector minus some thousands, disappeared. The law formerly, if it does not now, prohibited Inspectors from buying or selling tobacco, and the intention was no doubt to make the Inspector an impartial Agent, favoring neither buyer nor seller. His whole duty was, and should be, to sample, cooper up, weigh, issue a receipt and when it was presented, to deliver the tobacco, for which services he was to receive certain stipulated fees. A large portion of our Inspection Law is worthless, if not injurious. As to the judgment of the Inspector in deciding on "passed," "refused" "too high," &c., it is mere folly—no buyer is influenced by it, and what is the value, (it may be asked) of any Inspector's opinion whose appointment depends on his political opinions and not on his judgment of the article he inspects? In all large markets it has been found necessary to establish an Exchange for the most important articles, where buyer and seller can meet at a certain hour and samples be exhibited. Witness the Grain and Flour exchanges in New York &c., and even in Petersburg. Brokers are also found to be most useful intermediate agents between buyer and seller, whose knowledge of the market is kept in active exercise, and whose business is similar to that of our Commission Merchant. By the establishment of such Exchanges, it is not longer necessary for the seller to canvass the city in search of a buyer, or vice versa, and it is the surest mode of obtaining the full value.

The Inspections of tobacco in Baltimore and New York are not attended by the purchasers, because it would involve too great a waste of time. The system pursued is to inspect each hogshead in regular rotation according to its delivery at the Warehouse, and before it is stowed away. The Warehouses are large buildings, three or four stories high, and it would greatly increase the labor if the tobacco were to be stowed away before being inspected. In sampling, the Inspectors draw a certain number of bundles of tobacco, neither more nor less from each break, and these bundles are secured with tape, the end of which is passed by a needle through the centre of the end of the sample, and sealed with sealing wax bearing the name of the inspection. The Maryland planter cannot have his whole crop inspected at once, unless it is all delivered at the

Warehouse at the same time. The Inspectors, without regard to instructions from the owner, inspect the Tobacco when it arrives and preserve the samples carefully until they are called for, and any person is at liberty to be present during the process of sampling, for which no particular hour is fixed, but it is continued throughout the day, if the quantity received gives sufficient employment. There being no regular daily demand to justify daily public sales, the sales are made by Commission Merchants or Brokers at their respective places of business and not by auction. A similar course is pursued at N. York and Philadelphia.

Under the regulations adopted by the members of the Tobacco Exchange in Richmond it must be obvious to any unprejudiced man that the system is far more advantageous to the planter or owner of tobacco than that which prevails at our Inspection Warehouses or in the other cities above named; by bringing into competition at one moment every purchaser, and submitting every sample in one large Hall, whether offered at auction or private sale; and leaving the owner the option of being his own vendor, or of employing an agent. The Planter can, if he chose to sell at auction and collect his money from the buyer, have his tobacco sold at the Exchange by the Crier—an entirely disinterested man—for the small fee of twelve and a half cents per hogshead Should he prefer to have the judgment of a Commission Merchant, who is well acquainted with the state of the market, and who would stop the sale if he thought the full value was not bid, he can, as he has done before, put his crop in the hands of such an Agent to sell publicly or privately as the judgment of the Agent may dictate, and the samples are kept ready for exhibition at the central point where the Exchange is established, or at the Agent's office if he thinks it preferable.

What reasonable objection can be made to this arrangement, by any disinterested party is inconceivable. There is no reason to suppose that the regulations adopted will be changed. If they should be, it will then be time enough to complain.

A DISINTERESTED LOOKER ON.

TOBACCO EXCHANGE OF THE CITY OF RICHMOND.

[The following are the Preamble and Resolutions adopted by the meeting of shippers, manufacturers and sellers of Tobacco, held in May last, for the purpose of inaugurating "the Tobacco Exchange of the city of Richmond."

They contain, we believe, the only regulations which have been published, or adopted, for the government of the establishment.—EDITOR.]

"Whereas, the experience of a few years past has produced the opinion generally with the tobacco dealers of the city of Richmond, that the increased facilities afforded to the farmers and planters of Virginia and North Carolina for the transportation of their produce to market, has induced them to send to this market a larger proportion of the tobacco crop than in former years; and whereas the great demand created by the large number of tobacco manufacturers of this city, and shippers who receive the principal orders, foreign and domestic, for the purchase of tobacco makes it to the interest of planters generally to prefer the Richmond market, and therefore is most likely to induce hither a still larger proportion of the crop; and whereas the large and increasing trade in this branch of business has been attended with great inconvenience, if not to all at least to the greater number engaged in it, and is now found to be almost impracticable with any degree of convenience and satisfaction to those of us to continue the old system of attending the daily sales of tobacco at three or more warehouses located at distant points of the city; and whereas it is deemed desirable to afford the amplest facility to the trade at large, and believing that the interest of buyers and sellers will be greatly subserved in the economy of time as well as conduce to the convenience and comfort to all alike: It is, therefore, recommended that a suitable central and commodious room be procured for the purpose of concentrating and conducting the regular daily sales of tobacco, both privately and publicly, in lieu of the former custom of sales at the different inspection warehouses of this city. And whereas it has always been found conducive to the best interest of the trade

that it should be conducted in accordance with such regulations as would best tend to protect the interest of all, secure unity of sentiment and action, and insure equality and fairness alike to all: Therefore, it is recommended that the following regulations be adopted by the trade:

"1. Resolved, That the room on the corner of Cary and 13th street, and over the store of Messrs. Robertson & Roberts, be for the present the place of resort for the trade, and that the same be styled 'The Tobacco Exchange of the city of Richmond,' and that the regular daily offerings of tobacco by private and public sale, be restricted thereat."

"2nd. Resolved, That the public auction sales shall be conducted by some individual familiar with the usages of the trade, having no conflicting interest of his own incompatible with the province of a fair and impartial auctioneer of tobacco."

"3d. Resolved, Until farther ordered, that no private sales of tobacco be commenced before 10 o'clock A. M., and also in like manner the public sale shall begin daily at 11 o'clock, A. M."

"4th. Resolved, That the former custom of chance-taking for the purchase of tobacco having been found to operate unequally, and to the disadvantage of many of the trade, it be henceforth abolished, and in future the rule to be observed for the regulation of private sales shall be in this wise, viz: When the vendor has placed his samples upon the sales' stand, any buyer presenting himself and proposing to purchase, shall be entitled to the privilege of trading; and when two or more make simultaneous proposals to buy, they shall determine between themselves, by lot or otherwise, the order of precedence."

"5th. Resolved, That all private bids for tobacco be regarded as sacred between the buyer and seller, and that no offer for tobacco, not accepted at the time offered shall be considered as binding the buyer, unless so agreed upon at such time; and in all cases the terms of private sales are not to be divulged without the consent of the purchaser and seller."

"6th. Resolved, That the former custom of public bids remain in force, viz: When tobacco is being cried at a price below six dollars, no bid for less than ten cents shall be entertained, and when over six dollars, not less than twenty-five cents per one hundred pounds, unless the bid be claimed by more than one, and the cryer is unable to decide who is entitled to it. In that event, an advance bid of half the sum, in either case, is to be received from either one of the parties; and in all cases, the cryer, if practicable, shall decide between claimants of first bids."

"7th. Resolved, That whenever a hogshead of tobacco is offered for sale at public auction, and not disposed of, and the same be offered privately afterwards, the refusal should be tendered to the last bidder, except in such cases where, for sufficient reasons, the vendor is unwilling to sell to the bidder."

"8th. Resolved, That any tobacco that may be offered at public sale can be retained by the planter or his factor, should he be dissatisfied with the price; this privilege, however, must be exercised directly after the tobacco is cried out, or not at all."

"9th. Resolved, That the same rule be applicable for private bids for tobacco, as stated in the 6th resolution, regulating public bids, viz: A full advance bid."

"10th. Resolved, That the interest of the trade requires that the Inspectors and commission merchants respectively describe upon their sample labels the condition of the tobacco when the sample is drawn, whether the tobacco is passed, stained, damaged, heated, or broken in the cask, and also the gross or nett weight, and accurately, as far as practicable, the proportion of any mixed hogshead.

"11th. Resolved, That during the progress of the public sales, all private trading for tobacco at the Exchange be conducted exclusively at the stand of the commission merchants."

"12th. Resolved, That the Auctioneer of the Exchange provide himself with a list of the inspections at the several warehouses each day, and that the sellers be called to the stand by said list, in the order heretofore governing inspections, viz: 1st, Seabrook's on Monday and Thursday, Shockoe on Tuesday and Friday, Public on Wednesday and Saturday, Dibrell's always following Seabrook's, except on Saturday, when it will be called second in order."

"13th. Resolved, That the regular public sales of tobacco be made strictly for cash payments."

"14th. Resolved, That it be the duty of the conductor of the public sales, as far as practicable, to see that the Exchange room is kept in proper order, and to prohibit smoking and all other practices inconsistent with the comfort or interest of visitors to the room, and also the seats at the public sales bench be reserved for the exclusive accommodation of the buyers.

15th. Resolved, That the inspectors at the several warehouses be requested to begin their daily breaks at the earliest hour of the morning practicable, and that the breaks be limited to such number of hogsheads as can be coopered up or secured from all liability to injury on the same day on which they are broken.

"16th. Resolved, That the custom of prizers marking their tobacco for inspection with fictitious marks, and thereby opening wide the door to fraud by which buyers have been and may be deceived or defrauded by false packing, be discontinued, and that they put their own names upon the same, and that sellers announce at the time of offering such tobacco that it is reprized, with the name of reprizer thereof protecting the innocent and honest reprizer as well as buyer against the less scrupulous.

"17th. Resolved, That, having a due regard to the economy of time in the prompt despatch of business, it is recommended that during the public sales all matters irrelevant to such business, as far as practicable, be avoided, and the attention of buyers and auctioneer combine for the conduct of speedy sales."

"18th. Resolved, That we elect annually, from our number, a committee of five—any three of which may act—representing the different interests of the trade—manufacturer, shipper, seller—to be called the committee of reference, to whom may be referred all questions of difference arising in the trade; and when both parties agree to refer the decision to this committee, it shall be binding.

The following resolution, offered by Mr. Gwathmey, was then adopted:

"Resolved, That any planter having his tobacco in the hands of Inspectors, and who may prefer to have it sold at the Exchange, when inspected, may do so, subject to the rules of the Exchange." *

Then the following committee of reference was elected by the meeting: John Jones, John Gilmour, John S. Walker, Samuel Hardgrove, Thomas J. Deane.

Mr. Sheppard was elected Auctioneer.

PRINCE EDWARD MEETING IN REFERENCE TO THE TOBACCO EXCHANGE.

At a very large meeting of the Planters of Pr. Edward, held at the Co. Ho., on June 21, Mr. Jno. W. Redd was appointed Chairman and Jno. H Knight Secretary. Mr. Jno. A. Scott stated the object of the meeting to be to take some action in reference to the "Tobacco Exchange" recently established in the city of Richmond, and upon his motion a committee of twelve was appointed to draft resolutions for the consideration of the meeting—expressive of the feelings and sentiments of the planters of the county in regard to the establishment of this "Tobacco Exchange." The following gentlemen constituted said committee, viz: F. T. Wootton, Jno. H. Knight, Edwin Edmonds, S. B. Scott, Thos. Clarke, H. G. McCargo, David Womack, T. T. Tredway, Newton Cunningham, Geo. W. Redd, Thos. Hickson and Richard Scott. The committee, after a retirement of an hour, brought in the following preamble and resolutions:

"Whereas, by a combination of the Commission Merchants and a portion of Tobacco Dealers of the city of Richmond, a "Tobacco Exchange" has been established in said city, thereby endeavoring to abolish the sale of tobacco at the Public Warehouses of the city—a custom long established by the law of the land, and one which gave general satisfaction to the planter; and whereas the attempt is made by the establishment of the Exchange to nullify the existing laws of Tobacco Inspections as enacted on our statute books and to place the whole management of the Trade under the control of a "Board of Trade," composed of Commission Merchants and Dealers," in which board the

*Note by the Editor.—On enquiry we learn that the Planter is not prevented by anything contained in the regulations from selling privately also at the Exchange, if he shall choose to do so.

planter has no voice; and who can, at any time, exclude the planter from the privilege of selling his own crop and levy such a tax in the way of commissions as may best suit the interest of the parties composing this Board. on all sales of Tobacco made at this Exchange; and, whereas, the evident intent of the founders of this Exchange is, and the inevitable result of its permanent establi hment will be, not only to abolish the sales of Tobacco at the various Warehouses as aforesaid, but also to force the Planter to sell his crops at this Exchange and thereafter to force him to put his crops in the hands of Commission Merchants, and to be thus taxed against his will. And whereas, the Commission Merchants have solemnly resolved that all offerings of Tobacco, both public and private, shall be made at the Exchange, and (with but few exceptions) publicly declare that, although ordered by the Planter to sell his crop consigned to them at the Public Warehouses, they will not obey his instructions, and will only offer them for sale at their Exchange, thereby assuming to themselves absolute and unwarrantable control over the property and rights of others and not remembering that they are only the Agents and not the Proprietors of consignments made to them. And whereas, the Commission Merchants and Dealers have their remedy at law for the mal-execution of the Inspection Laws and grievances of which they complain, are about assuming to themselves the absolute control of the whole system. And whereas, the establishment of such Exchanges in the larger cities have always resulted in the exclusion of the grower from the privilege of selling his own produce as he may think proper and forcing him to employ an Agent against his will, Therefore

Resolved, 1st. That we will resist, by all means in our power, the establishment of "The Tobacco Exchange" in the city of Richmond and the attempt of its founders to subvert the existing laws on Tobacco Inspections and to infringe on our rights as planters.

2d. That we will not sell our crops at this Exchange, and will only offer them at the Public Warehouses until the existing laws be amended and some other place of Public Sale be established by the law of the land.

3d. That we regard the assertion of the Commission Merchants that the establishment of this Exchange was demanded by the Dealers as a body, and that they were forced to adopt it, as erroneous; that we do not concede, nor do we believe that a large portion of he Dealers of Tobacco claim the right to control the trade as asserted by the Merchants.

4th. That we regard the resolution passed by the Commission Merchants at their meeting inaugurating the Tobacco Exchange restricting "all the offerings of Tobacco, both public and private," to the Exchange, and the public declaration of all (with but ew exceptions) that though ordered by the planter to sell his crops consigned to them at the Public Warehouses, they will not obey his instructions, as an unwarrantable and aggressive assumption of power, and that we pledge ourselves not to employ any man as our Agent who has entered into any such combination and feels himself bound by any such resolution, believing that our interest could not be safe in his hands.

5th. That if the necessities of the Trade require the establishment of some other mode and place of selling Tobacco than such as are now established, we will petition the next Legislature for such an amendment of the existing laws as will establish a suitable place or places for that purpose—the same to be regulated by law, and the rights of all parties defined and secured by the law of the land and not left to the caprice or control of a self-constituted Board.

The above preamble and resolutions were adopted by the meeting unanimously. The meeting was addressed by A. D. Dickinson and Jno. W. Wilson.

Jno. A. Scott offered the following resolution, which was unanimously adopted:

Resolved, That we will seek some other market than Richmond for our produce rather than be forced to sell at the Tobacco Exchange through the Agency of Commission Merchants.

It was further

Resolved, "That the proceedings of this meeting be sent to the Farmville Journal, Richmond papers, and the Southern Planter for publication.

The meeting then adjourned.

JNO. W. REDD, Ch'n.

Jno. H. Knight, *Sec'ry*.

For the So. Planter.

Stimulating Properties of Guano.

It is not my purpose, Mr. Editor, in this communication, to persuade a single individual to invest his means in guano, to increase the production of wheat. The propriety of such investment, every farmer will determine for himself, making his calculation with reference 1st, to the relative prices of wheat and guano; and 2ndly, to the relative production of labor and capital, *with* and *without* the use of this costly manure. It is my object only to defend guano against some of the vulgar prejudices entertained against its use, and thereby to vindicate science and the cause of truth.

Agriculture in Virginia is pursued by every variety of capacity and qualification, from the entirely unlettered to the learned, and consequently we may expect to hear every variety of opinion expressed, that ingenuity or stupidity can devise. Many of these various and often conflicting opinions are extensively entertained and acted on by thinking and educated men, because they do not trouble themselves to enquire whether or no they are consistent with the known laws of nature, when the least consideration would satisfy them that they are wholly irreconcilable with those laws, and altogether opposed to the axioms of science.

It is not uncommon to hear gentlemen of good education, who are regarded as eminently practical and judicious farmers, urge as an objection to the use of guano, that it "stimulates the soil;" and as all action excited by artificial means is sure to be followed by a depressing re-action, that therefore the exhaustion of the soil is the necessary consequence of the application of guano. A little reflection would convince them that the soil is incapable of being thus acted upon. "Mother Earth" has neither brains, nor spinal marrow, nor other element of a "nervous system" to render her susceptible to such influence.

In this exemption she is vastly superior to all her sex. For what would be the consequence if she had nervous sympathies and sensibility, and her nerves should become unstrung? What if she should become flighty and hysterical? Dames of more modern date would find an apology in her example, and something more pungent than guano would be necessary to quiet their agitation.

It is not surprising that such objections should be urged by that class of farmers who consult the moon upon so simple a matter as the laying of a worm fence; but that educated gentlemen, who are looked up to as oracles in things pertaining to good farming, should advance such objections provokes a smile in spite of good manners.

But let us dismiss this objection, and proceed seriously to consider the question whether *guano is a mere stimulant of the plant, or is it only its appropriate pabulum?*

We charitably suppose that most of our intelligent farmers, when they assert that "guano is a mere stimulant," mean that it simply stimulates the plant to increased activity without furnishing anything to its support, but how this is accomplished I do not understand. I do apprehend how in the animal kingdom agencies of this kind are more or less operative, but I have yet to learn the mode in which the vegetable kingdom is rendered thus impressible.

Let us however endeavor to attain to a clear understanding of what is meant by a stimulant in this limited or exclusive sense. In its common or general acceptation, a stimulant is any agent that exalts or quickens the vital forces or actions. Now this embraces not only those that merely quicken action, but also all articles of food; so then the term used in the limited or exclusive sense is not intended to designate what is the pabulum of plants, otherwise it would be applicable to all other manures as well as guano.

The question then very naturally arises:—does guano merely produce an *impression* or *sensation* in the plant that causes it to make a greater demand upon the soil for its prepared food? or does it supply the nutrition which the plant requires for its sustentation and growth? If it is to be understood in the latter sense, then is guano nothing different from all other manures which supply the inorganic constituents of the plant, and that it must be so understood is evident from the fact that vegetables are not susceptible to the action of mere stimulants. It would have been an unnecessary provision of nature for them to have been constituted with such susceptibility. Animals that have to seek their own food are endowed with sensation, and are urged by the calls of nature to use the powers of locomotion with which they are constituted, to meet the demands of appetite, but the poor plant *feels* no want of food, and if it did, it is incapable of making any exertion to obtain it.

But while they are destitute of the semblance of nervous excitability, they are nevertheless provided with organs of circulation, respiration, absorption and secretion. These organs are controlled by physical laws, and unlike the animal economy are entirely independent of any, even the rudest form of nerves. Yet, notwithstanding this destitution of a system of nerves, it is true there does exist a mysterious force—a "*vis vitæ*"—a "divinity that shapes its ends." But *how* it exists and where this force resides is beyond human ken, for "who by searching can find out God?"

Animals by reason of their organization are peculiarly susceptible to the action of stimulants, and we have examples of the operation of *mere stimulants* in increasing the "vital forces" by producing sudden emotions, such as hope, joy and anger. Also of the more material agencies of alcohol, opium, ammonia and

kindred preparations. These all excite an influence over the functions of animal life through the medium of the nervous system. But we have no knowledge of any such effect being produced upon any member of the vegetable kingdom.

There are agents in nature to be found in all its kingdoms—vegetable, animal and mineral—that are capable of exalting the vital manifestations in a more permanent manner, both in animals and vegetables, which are nothing more at last than the products of decomposition, destined to *re*-composition. Under the influence of such stimulating agencies, development, growth and maturation are the necessary results.

These stimulants contain within themselves the elements of nutrition and fertility, and after proper elaboration in the *soil* for plants, and in the *stomach* for animals, find their way, under the guidance of an inscrutable providence, to the very place in the organization they are suited to occupy. This is the kind of stimulant we take guano to be; the same that corn is to the poor horse; or beef-tea to a convalescent patient; or in other words, what is vulgarly called a belly-stimulant, as Mr. Weller would say—"*victuals.*"

Then if guano contains—as analysis proves it does—all the elements of nutrition that are common to other manures, and produces like effects upon the growth of plants, wherein does it differ from them, and why should it be singled out from the rest for condemnation, as hurtful in its application to the soil? But it is objected, that "it does not last like manure, that it will produce only one crop, and therefore cannot be like it in its nature."

The same may be said of beef-steak for breakfast. It only gives you additional power and muscular strength to last until dinner. Was this ever urged as a reason for not taking the steak? A costly business is this eating every time we need a little store of nervous energy and muscular strength. It is not more essential however than this manuring every time we expect a large yield of crop from the soil. As well might we expect our tailor to cut us two garments out of the material furnished for but one, as to expect two or more large crops from one application of 200 pounds of guano. There is good reason why farm-yard manure should be more permanent. Not because it is intrinsically better than guano, but because it is usually applied in the proportion of twenty tons to the acre, where not more and often less than 200 pounds of guano is applied. If the difference in permanence is as great as the inequality in the relation of 20 tons of manure to 200 lbs. of guano, then I will admit that the former has the advantage in the matter of durability.

I do not mean to advocate the use of guano in very large doses in order to produce a more permanent effect, because I believe it possesses caustic properties, which if used in excess would prove inimical to vegetation, but supply it in suitable quantity and under proper circumstances, and I will warrant a remunerating return. And if you fail to get that return in the next crop, rest assured that 'mother earth' has stored it away for a rainy day, which when it comes will impart to you the satisfaction of knowing that you are "in clover."

WM. A. BRADFORD.

Greenville, Clarke Co., June 1858.

For the Southern Planter.

Experiments with Guano.

Mr. Editor,—I propose offering the results of sundry experiments with guano, made by me within the last few years, with a view of testing the benefits of the several varieties, as well as reducing the outlays of these expensive fertilizers. The first experiment was made in 1850, on two acres of land sown in wheat, to which was applied 560 lbs. of Peruvian guano. Having a small portion left after that applied to the two acres, I added about double its quantity of ashes and applied it to a very thin spot of land sown in wheat, which produced a crop far surpassing my expectation, since which time it has been cultivated in its regular rotation, and each crop has shown the spot to which it was applied, by a growth of corn and wheat far surpassing the land immediately adjoining. My second experiment was with Colombian three years since, applied to land sown in wheat late in the season, and extremely thin, at the rate of two hundred pounds per acre, this produced a remunerating crop; the field was turned to pasture, and so remained until planted in corn the present year, the corn at this time on the land sown in guano is more than double the size of that immediately above and below it, exhibiting as luxuriant an appearance as if the land had been cowpened, as pronounced by two experienced farmers who have viewed it. In 1857, after planting my corn, I applied about two hundred pounds of Colombian guano per acre, and the same quantity of equal portions of guano and leached ashes, which were harrowed in, they produced a good crop of corn notwithstanding a very unfavorable season for its maturing. In the fall, the land was sown in wheat, without an additional aid, and now presents a prospect of a remunerating result, notwithstanding the ravages of the fly and joint-worm. The mixture of ashes and guano produced a better crop of corn than the guano, and promises a like result in the wheat crop. Last fall I purchased a ton of Peruvian and a ton of white Mexican guanoes, these were mixed in equal quantities and applied to a portion of land sown in wheat, the remainder of the guanoes so mixed was added to a like quantity of ashes and applied to the wheat, in like quantities with the mixed guanoes—if there be a difference in the wheat, it is in favor of the guanoes and ashes. Should a

mixture of guano and ashes upon further experiments, prove to be as beneficial as in the cases to which I have alluded, a saving of fifty per cent will be realized by the former, and the Colombian guano as a permanent fertilizer will be prefered to the other varieties. I omitted to remark that Colombian and Peruvian guanoes were mixed in equal quantities, as were the white Mexican and Peruvian, without any perceptible difference in the wheat crop.

RICHARD ROUZEE.

Oakland, June 22d, 1858.

For the Southern Planter.

Injury to the Farmer from Exaggerated Accounts of the Growing Crops, &c.

Mr. Editor,—It is an adage both old and trite, but nevertheless true—"that error often runs around the world, while truth is putting on her slippers." There is another, I believe equally true, "that farmers are proverbially croakers." To the truth of these two aphorisms may be ascribed much of the injury each returning season brings to the varied and important interests of the Farmer, through the ever active and powerful agency of the press.

Bulwer makes the remark, "that the pen is mightier than the sword"—alas for the interest of the farmer! a single waif from the brain of an idle traveller, borne through the country with the velocity of steam, has often proven "more terrible than an army with banners." We are told in the quaint verse, but pungent satire of Butler, that

> "Doubtless the pleasure is as great,
> Of being cheated as to cheat."

It may be from this text that the scribler derives his right to speculate; if not, it certainly cannot be from the one subjoined, from the inspired pen of one greater than Butler—St. Luke —XVI, 12.

"And if ye have not been faithful in that which is another man's, who shall give you that which is your own."

Agriculture is a pursuit which underlies the whole superstructure of civil life. Its antiquity denotes its importance and its history presents the most imposing array of benefactions to mankind that can be found through the whole range of human history. Its victories are the peaceful conquests of the plowshare; the triumphs of progressive civilization over every element of barbarism. Its mission—the diffusion of contentment, happiness and prosperity; the promotion of the triumphs of mind and the transmission of the blessed light of the gospel to every land, on the wings of commerce, nourished and fed by the exuberance of its productions;—and its monuments, the imperishable gratitude, and ceaseless aspirations of every heart in the land it blesses. Such is the high vocation of the farmer—such the benefits resulting from his labors. Is it not strange, that men are to be found who through ignorance, thoughtlessness, or a misjudging avarice, would stab his interests, impair his capital, and cripple his energies, by systematic misrepresentation, when if the work of disparagement and depreciation were let alone, the result would most probably be to benefit alike the producer and consumer? I am induced to make these observations from having seen newspaper paragraphs this season, and in fact during every season, referring to the prospects of the growing crops, at stages of their growth, when even the most experienced ohserver can form no just estimate concerning them, couched in such terms of extravagance, very often, as to betray a deliberate design to depreciate them in the market from apparent sinister motives, or as to manifest, (to say the least,) a criminal ignorance or daring mendacity on the part of the writers. They justly merit that "whip of scorpions," which an outraged public sentiment speaking through the same organ—the press—can alone administer. No man has a moral right to express an opinion about any thing affecting the interests of others of which he knows nothing—nor can he be held as guiltless, when through ignorance or otherwise he dares to give publicity to it. Such is the facility and rapidity with which information now spreads, that such paragraphs are scarcely cold from the press, before they are caught up and borne with the velocity of steam to foreign shores and transmitted with lightning speed over the continent of Europe, thereby sweeping, with a single brush of the pen, millions of dollars from the hard earned toil of the farmer, into the pockets of speculators. How is this to be remedied? Very easily! In the first place every man should observe the golden rule contained in the eleventh commandment, "let every man attend to his own business." And, secondly, we should have more authentic information than we now have, as regards both growing and harvested crops.

Not statements made by farmers, because they rarely write, and if they did, as we before said, they would be regarded as "interested croakers," and would not be believed.

Let the Farmers Assembly appoint a committee—the executive would answer well—whose business it should be to appoint subcommittees in each county; with the obligation to report to the secretary of the society—each month during the year. The information should be digested and laid before the executive committee at each of its monthly meetings to be published or not as the wisdom of that body might determine.

Such publications would soon be regarded as authentic, and all official statements from such a reliable source would address themselves to the confidence of the public with the same assurance of credibility, with which the reports through the Mark Lane Express are received

throughout England and I believe the world. Every farmer would take pleasure in communicating facts, and furnishing statistics to the local agent, by which a mass of information would be acquired, calculated greatly to enrich the archives of the society.

Our crop of wheat was early rusted on the blade, to an extent unparalleled, with but little on the straw, until near the maturity of the grain; but to all who know the important functions performed by the leaf—of respiration and nutrition in the physiology of plants—it would be needless to speak of the injury done to the crop. Apropos of rust! What is it? The question has been much mooted, but I have satisfied myself by a critical examination of it under the field of a microscope of considerable power, that it is the oxidation of the mineral or organic, probably both, ingredients of the exuded sap, which escaping from the plant by the bursting of the sap vessels, caused by excess of rain, alternated with heat and cold, and concreted on the side of the stalk in the form of small grains. So then, rust is merely a symptom of disease, as dropsy is in medical pathology, and not the disease itself.

Our oat crop is also well nigh a failure. In many places it will not be cut at all, in consequence of the ravages of a parasitic insect.

In the agricultural department of the Patent Office Report for 1855, plate vi., fig. 2, an accurate drawing is given of this fly, and a sketch under the head of Aphis, or cotton louse of the South. The insects here were examined under the microscope and proved identical with the one in the sketch given. It has six legs, two horns, two prominent black eyes, a sharp bill, and wings when nearly grown. It was never known to exist here before, and has proven much more destructive than the chinch bug, which it seems to have supplanted.

Yours, respectfully,

June, 1858. NOTTOWAY.

The Cultivation of Clover.

[We commend the following essay on the important subject of "the cultivation of clover" to the serious consideration of our readers. The author, Col. McCue, is entirely at home on the subject. Having been a successful cultivator and a winner of the premiums of the Virginia State Agricultural Society for the largest production per acre, and the best specimens of seed, he speaks of the profit and advantage of this important branch of husbandry from his own personal knowledge. His counsel ought therefore to be authoritative with those who would conform their operations to the suggestions of enlightened experience gained from successful practice.—*Editor.*]

If "he is a benefactor of his race who causes two blades of grass to grow, where but on grew before," how much more worthy of suc praise is he who besides causing a much lar ger increase of production can by his effort succeed in enlisting a general and earnest a tention to the the much neglected subject c clover culture?

Why is it, that from the Chesapeake to th mountains—in the Valley—and even the trans montane section of Virginia, the eye of th traveller is often pained with the sight of gall and gullies, brakes and briers, and thorns an thistles, usurping the place of the grasses, th ameliorating and fertilising agents of the soil It is because there has been a too widespread and deep-seated indifference on this subject—the grass. It has for many years been a re proach to Virginia, that with all her capacity for production, she has witnessed the humili ating spectacle of the introduction of the grass es from Maine, New York and other States into all her seaboard and tide-water cities and towns, yea even in towns of the interior, such as Lynchburg and others, at a cost from fif teen to twenty-five dollars per ton, to the ex clusion of a much better quality of hay, that we *can* and *must* make. Why is it, permit me to enquire, that among the articles of freight, crowding the cars and blocking up the depots of our several rail roads and the boats of the James River canal, emptying themselves on the wharves of Richmond, Petersburg, Alexandria and Norfolk, that we do not see the bales of *sweet scented hay* from the uplands instead of encountering it, on its *upward* passage, *from* those points, to the interior?

Too little attention has been bestowed on this subject, and the fear is that in our efforts to *cheapen* guano, and increase our crops of tobacco, corn and wheat, we will continue to lose sight of these the *most important fertilizers*—the grasses. No one can doubt, that clover is the *Sampson* if not among the grasses—certainly among the fertilizers.

Much of the difficulty attending tho cultivation of clover, according to the experience and observation of the writer, is attributable to the defectiveness of the seed sown. In the Valley counties where it is cultivated, the farmer raises his own seed, year after year on the same soil. Every succeeding crop exhibits a falling off in the vigour and luxuriance of the hay and an increasing tendency to deterioration in the quality of the seed, consisting of light chaffy grain, often destitute in a great measure of the germinating principle.

This seed transported to the counties east of the Ridge, cannot recover by a change of soil and climate, although a slight improvement may be visible. *There* the practice is seriously defective, in putting on too limited a supply of seed and in pasturing stock upon the young growth and keeping it down. In the Valley an occasional introduction of the best quality of seed from Pennsylvania or Maryland is de-

sirable. Greater pains should be taken to keep the seed free from the noxious weeds which, now alas! are spreading with alarming rapidity over the State. To insure a certain stand of clover any where, a more liberal supply of seed is necessary. From a bushel to a bushel and a half to eight acres is far more economical than to spread *one* bushel over *ten* acres as is too common. To guard against the killing out in winter, it is a safe precaution to sow part in the fall and the remainder in the spring. Clover delights in a *deep* soil—and hence the feeble and meagre crops formed on land badly prepared. The writer has succeeded best on land broken up to a depth of twelve and thirteen inches, the seed sown with a seed-sower attached to a Pennock drill, and followed by a cast roller of eighteen hundred pounds weight. Too much care cannot be taken to guard against the daisy, plantain, blue thistle and other noxious weeds, and a heavy penalty *ought* to be meted out to him who would knowingly sell to his neighbor or send from home, seed abounding in such filth. Legislative enactments ought to be brought to bear against this evil. If the man is culpable who knowingly permits his cattle, afflicted with a contagious disease to run at large and impart it to his neighbors stock, how much less guilty is he who sells to his friend or acquaintance grass seeds containing those pests, which if once they gain a foothold retain it to the injury of the farmer and the soil for generations to come?

If lands, designed to lie for some time in grass, are sown in clover, it is best to put one third part of timothy with two thirds of clover, thereby insuring a better quality of hay, and also making a firm and stiff sod.

Plaster and ashes should be sown early in the spring on the young clover. It should be mixed in the proportion of one third of the former to two thirds of the latter, and sown at the rate of a bushel per acre. This will not be found too heavy. When clover seed is intended to be saved, the clover should be cut before harvest, to give time to the second crop to ripen before frost. Often a heavy crop of seed is obtained after pasturing off the first crop. A too luxuriant crop of straw is unfavourable to a full crop of seed. So soon as the greater part of the heads have become brown, it is important to commence cutting the seed, which is most speedily secured by using a scythe with two fingers attached, and cutting two swathes together. The labour of raking up is much lightened in this way, and the straw gathered closer than by any other plan. The straw should lie some days in swath, to dry the heads thoroughly so as to facilitate the threshing of the seed. This may be done either by treading out with horses or threshing by a machine. To those not judges of *good* seed, it is suggested that a plurality of dark-coloured or purple grain is generally sound and heavy, and sure to vegetate. The presence of light and chaffy grains, and too much dust and dirt in seed offered in market may be most easily detected by wetting the finger and thrusting it into the bulk—when the good seed will usually fall off and leave the light grains and the dirt adhering.

Fearful that this essay may be drawn out to an unsuitable length—conscious of its defects, and yet hoping that it may serve a useful purpose in attracting attention to a subject which lies at the foundation of Southern agriculture, the writer most respectfully submits it to the indulgent consideration of his brother farmers.

J. MARSHALL McCUE.

We have received from a friend in Norfolk, the following extract from the Report of the Committee of the Corn Exchange of that city.

The *statistics of the farms* mentioned, were published in the "Planter" for June, 1857. It will be seen from the "Report," that there can be no doubt of the truth of the figures. These show so large a profit to those engaged in the "trucking" business, that we gladly republish the farm accounts, to show the capacity of the soil in the vicinity of Norfolk, for gardening and trucking purposes.—[Ed.

The Capacity of the Soil of this Vicinity for Trucking or Vegetable Purposes.

Among the other especial advantages of this locality, we must name its peculiar capacity for Trucking purposes. Truck-raising requires the conjunction of three essentials. A peculiar composition of soil, an early climate, and regular, cheap and speedy carriage to market. All these requisites are found here in an eminent degree. The soil is light, quick, and easily cultivated. The climate sufficiently warm to compete with any other portion of the coast; while packages can be sent to Baltimore in ten, to Philadelphia in twenty, and New York in twenty-four hours from the time of leaving the harbor—a combination of advantages which it is safe to say cannot be found in any other part of the Union, and which affords us every guarantee that the trade will not only be sustained, but that it will be greatly extended as the cities North increase in number, extent, population and wealth; and when the cultivation extends to all the vegetables and fruits that are grown by northern gardeners. Considerable land is now occupied in raising vegetables, but there are great many equally eligible farms that may be purchased at a comparatively low figure, and upon which an industrious man can scarcely fail to realize a handsome competence by a few years of skilful application. To show the profit made upon these farms, we give the following statistics, which we gathered from the Report of the Committee on Farms of the Seaboard Agricultural Society, for the year 1856. The Com-

mittee report that four farms were offered as competitors for the Premium, with the annexed returns of their sales, expenses and profits:

1*st. The Armistead Farm*, (100 *acres*), *originally poor.*

Gross amount sales for the year,	$17,128 28
Expenses, including everything,	6,590 78
Leaving a profit of - - -	$10,537 50

or $105 37 per acre for the entire farm.

2*nd. The View Farm.* (100 *acres.*)

Gross amount sales, - - -	$13,825 81
Expenses, including everything,	6,500 00
Leaving a total profit of - -	$7,382 81

or $73 52-100 per acre for the entire farm.

It should, however, be remarked that a portion of the money charged as "expenses" on this farm, was expended in the purchase of stock, agricultural implements, &c., which could not have been legitimately charged against the farm expenses of that year.

3*rd. Mercer & Ivans' Farm, of* 20 *acres.*

Gross amount of sales, - - -	$6,000
Expenses, - - - - - -	2,500
Leaving a profit of - - - -	$3,500

or $175 per acre for the entire farm.

4*th. The Wilson Farm, of* 25 *acres.*

Gross amount of sales, - -	$7,584 62
Expenses of all kinds, - -	3,371 45
Showing a profit of - - -	$4,213 17

or $120 37 per acre for the entire farm.

These returns were corroborated to the entire satisfaction of the Committee on Farms. And as a proof against the supposition of exaggeration, we may state that two of them were rented on shares, and that the exhibitors were obliged to account to the owners of the soil at the rate of profit here given. They show, we are confident, a larger margin of profit than any bodies of land of similar extent in the Union. Yet the very land upon which these enormous profits were made was rated, ten or fifteen years ago, at from 10 to 15 dollars per acre. And even now, farms may be purchased at these rates, which only need the hand of industry and skill to make them almost equally profitable. The area of country adapted to this peculiar culture, will be very greatly extended by the opening of the new canal.

For the Southern Planter.

On Stacking Hay and Grain.

The June number of the Planter contains a communication, copied from the Genessee Farmer, on "stacking hay and grain;" which, it seems to me, gives very erroneous directions for that important operation. The primary object in building a stack of either hay or grain, is to make it turn water; and if, from any defect in its construction, the water runs from the circumference to the centre, the stack is ruined. This undesirable result can be prevented, I think, more effectually and certainly by adopting and following a plan the opposite of that so confidently recommended in the article referred to. The writer in the Genessee Farmer directs that the centre of the stack shall be kept "hollow" until you have reached within four or five feet of the top. The effect of this will be, that as the stack settles, the centre, being less compact and firm than the outside, will sink more than any other part, and result in the elevation of the outer ends of the hay or grain, giving them an inclination towards the centre, thus carrying the water that falls upon the stack in that direction instead of shedding it off like a roof. By adopting the plan of Mr. Howatt, a neater looking and more symmetrical stack may be built; but this is a case in which nothing useful ought to be sacrificed to "looks." I think the most secure and safe method of stacking either hay or grain is to keep the centre well filled up and compact, so that it will at least settle no more, if as much as the outside. The effect of which will be to give to your hay, or grain, an inclination downwards from the centre to the circumference, thus effectually preventing any water from reaching the heart of the stack.

A farmer of this county, alike distinguished for his energy and excellent practical sense, and who makes a large quantity of hay every year, scarcely gives any other directions to his stackers than to "heart well." And he never rides by where the operation of stacking is going on, without calling out in a loud, clear voice, "heart well, boys, heart well." And he, I feel confident, has never lost a hundred pounds of hay from a defective stack.

I am inclined to think that one of Mr. Howatt's twenty ton hay-stacks, on a bottom one rail square, (if his rails are as we make them, eleven feet in length,) would present very much the appearance of a pyramid standing on its apex.

The usual size of hay stacks, in this county, is about three tons, frequently less than that. T.

Augusta co., June 28th, 1858.

Is Agriculture Declining in the United States.

We observe in the proceedings of Congress that a bill has been submitted by Mr. Morrill, of Vermont, proposing to grant to the several States 5,920,000 acres of land, to be divided among them in proportion to the number of Senators and Representatives they send to Congress. The object of the bill is to encourage agriculture, which he claims is declining in all the States of the Union. He says that it will "do something to induce farmers' sons and daughters to cluster round the old homestead; something to remove the last vestige of pauperism from our land; something for peace, good morals, churches and common schools; something to enable sterile railroads to

pay dividends; something to enable the people to bear the enormous expenditure of the national government; something to check the passion of individuals and of the nation, for indefinite territorial expansion, and to preserve them from ultimate decrepitude."

In relation to the decline of agriculture in the United States, Mr. Morrill says:

"The quantity of food produced bears each year a smaller proportion to the number of acres under cultivation, and that over a very wide area some of the most useful crops bid fair to become extinct. In the New England States alone, the wheat crop, instead of increasing with the population, fell from 1840 till 1850, 2,014,111 bushels to 1,090,132; and the potatoe crop during the same period from 35,180,500 bushels to 19,418,-181. The Southern States are hardly any better off. In the four States of Tennessee, Kentucky, Georgia and Alabama, there was a falling of in the wheat produced during the same period of 60 per cent., or more than half. The State of New York is probably one of the best in an agricultural point of view, in the Union. The farms are larger, and more capital is invested in them, and more skill applied in cultivation than in any other. Yet the number of sheep now is 300,000 less than it was thirty years ago, and within the last five years has declined at the rate of fifty per cent. The product of wheat has fallen from 13,391,770 bushels in 1845, to 6,000,000 in the past year.

To be brief, Mr. Morrill assumes that in every State in the Union agricultural statistics tell the same story. With the largest area of arable land of every nation in the world; with the smallest population in proportion to the square mile; with the lowest rate of taxation; with a skill, enterprise, ingenuity, and freedom from all feudal trammels, we appear to be fast returning to the wilderness state, and upon the condition of absolute dependence upon the taxed and overcrowded Europe, for the bread we eat, and the beef we roast, and the horses we ride.

Mr. Morrill's scheme of relief is the construction of thirty-two agricultural colleges, which are to inaugurate a new era in agriculture, revive it from its present progress retrograde condition, and establish it upon a solid and enduring basis.

The increase of cities in the United States in proportion to the increase of the surrounding country, is greater than in any other country in the world and appears to accelerate as the nation advances in wealth and intelligence. We have no doubt any thing that would render a country life more attractive than it is at present, would tend to remedy this tendency, and colleges designed to elevate agriculture into a science, might be a step towards this object. Another step would be that of throwing open the public lands to the people; a movement which would, more than any other, remove the pressure from our cities, and subsequently add immensely to their wealth and importance.

No doubt, agricultural colleges have been productive of great benefit in older countries. England, Ireland, France, Austria, Germany, and even Italy have felt their beneficial influences, and the United States would not prove an exception. In some States, movements have been made towards their establishment, but with what results we have not the statistics at hand to enlighten us.

At any rate, the movement of Mr. Morrill of Vermont will be productive of one good effect, and this is the calling attention of the public generally to the state and condition of things, which he proves from the census statistics.—*Chicago Democrat.*

From the Genessee Farmer.

Original Domestic Receipts.

Stewed Chicken.—Prepare and cut up the fowls, in proper pieces for the table; put into the stew-pan or kettle, with plenty of salt and pepper to season; and what butter you wish, and a small quantity of saleratus (not enough to discolor) to assist in making it tender, and prevent its rising on the stomach; and only water enough to cook it, cover close, and stew moderately. Turn occasionally that it may cook and season evenly; when nearly done, remove the cover, that the water may moderately evaporate. If you choose, dredge and boil in some flour. Turn on some sweet cream, boil up and serve. Squirrels are good cooked like the above, omitting the cream.

Brown Gravy for Roast Fowl.—Chop the heart, liver and lights of the

fowl; put into the spider with butter, pepper, salt, and a little water. When boiling well, add some sweet cream and boil. Stir it, or it will burn.

RAISED BISCUIT.—Heat three cups of sweet milk with one of butter; work it warm into the butter, with a tea-spoon of saleratus. Have ready some yeast or light sponge, the same as for bread, work this in when the mixture is milk-warm; mix it well, but not stiff, and set in a warm place to rise. When light, mould into cakes, let them set a while, (five minutes or so,) prick the tops of each; bake in a quick oven. These are similar to those made from bread dough. Cold biscuit can be warmed to taste like new, by turning cold water upon them to wet the crusts, then warm through in a moderate oven.

SODA BISCUIT.—One quart bowl of flour, one tea-spoon of soda, two of cream tarter, salt, sour milk and sour cream to mix; bake quick.

LEMON PIE.—One grated lemon, one beaten egg, one tea-cup of sugar, one and a half tea-cups of sweet milk, three tea-spoons of flour. Must not add the lemon till just as you set it in the oven. Bake with two crusts. Mix and bake as common custard pie.

ANOTHER.—Beat the yolks of four eggs, add the grated rind and juice of one lemon, and five table-spoons sugar; bake with an under crust. When done, add the whites of the eggs, beaten to a froth, with five table-spoons of white sugar; bake again a few minutes. *Try it.*

EXTRA CUP CAKE.—Mix as written. One cup butter stirred to a cream, two cups sugar; the yolks of four eggs, tea-spoon of essence of lemmon or sweet almond; one tea-poon of soda dissolved in a little hot water put to one cup sweet milk; then three cups flour, the whites of four eggs beaten to a froth; lastly, two cups of flour with two tea-spoons cream tartar, well infused; one cup wine, *if you like.*

BAKED CHICKEN.—Dress the chicken, then make a dressing with which to fill it, of light bread crumbled fine, a lump of butter the size of a hen's egg, some pepper and salt: moisten with water. Place the fowl in a pan, with a pint and a half of water, sprinkle a little salt over it, and bake half an hour.

Is the Chinese Sugar Cane Poison to Horses and other Animals?

We have seen (says the *Valley Farmer*) several statements going the rounds of the papers, to the effect that horses and cattle, in a number of instances, have been poisoned by eating the seed of the Chinese sugar cane. But the most conclusive cases of the kind are detailed in the *Ohio Farmer*, by W. Pierce, Veterinary surgeon, in Ravenna, Ohio. The facts as related are substantially these:

A farmer in Portage County, Ohio, raised a quantity of the Chinese sugar cane, and saved the seed and blades. In the course of the winter these were fed for two weeks to two valuable horses. Having occasion to go a few miles, the farmer took one of the horses to ride. At first the horse appeared well and playful, but when about a quarter of a mile from home, he became suddenly ill; his head fell, his legs and body were drawn up, his limbs became stiff and greatly bloated, both in body and muscles. He was finally got home, sweating profusely He remained in this condition during the day. With careful treatment, after twenty-four hours, the internal bloating began to subside, but his muscles remained bloated for about five days, and then suddenly subsided, leaving a large swelling high up on the back part of the fore arm. This continued to swell to the size of a gallon, remaining for four weeks, then mattered and discharged and began to disappear. About an hour after returning with the horse, the owner started for the same place with the other. After proceeding about three quarters of a mile, he was taken almost precisely as the first. The commencement, continuation, progress and termination of both, were almost identical. A neighbor of the adjoining farm had a horse that eat the seed and leaves for two or three days, while grinding the stalks, and was similarly affected, for about the same length of time, with swelling in the same manner. M. Pierce examined this case on the first of February, and describes the condition of all of them, and concludes by saying—*the seed did not mature, was frosted and began to mould when fed.*

We have no idea that this grain, when matured and sound, is poison, or in any way injurious to domestic animals, any more than Indian corn or oats. That, and kindred varieties of the millet family, have been cultivated and eaten by man and beast for ages. But any of the cereals that have been wet and become mouldy and in a partial state of decomposition, when dried and fed to horses or cattle, have frequently been known to produce disease and death. We have known a number of instances of the kind, but the precise symptoms we do not now remember. One of our neighbors, some years ago, lost a valuable cow from being fed on oats that had been wet and become mouldy and partially rotten. And so we have heard of other instances where cattle had been fed on corn in the same condition; and we have no doubt it was this change that the sugar cane seed had undergone, that caused the mischief in each of the cases referred to.

From the Central Gazette.

The Philosophy of Boiling.

The scarcity and high price of fuel—particularly of wood, in many parts of the West—the time and labor expended in procuring it, especially by those farmers who reside at a distance from our public roads and thoroughfares, render it advisable to study economy in its use; and whoever, from experience or observation, can suggest any improvement in this respect, that can be made generally available, without diminishing our physical comfort, cannot but be considered as doing a public benefaction. Without presuming to offer any thing *new* on the subject, or wishing to become a trespasser in the domain of housewifery, I beg leave to call the attention of the readers of the Gazette (especially the "fairer" half,) to a single point which I deem worthy of their consideration.

"The process by which food is commonly prepared for the table—*boiling*—is so familiar to every one, and its effects are so uniform, and apparently so simple, that few have taken the trouble to enquire *how* or in what manner these effects are produced. So little has this matter been made an object of enquiry, that few, very few, indeed, it is believed, of the many persons who, for so many ages have been daily employed in this process, have ever given themselves the trouble to bestow one serious thought on the subject.' It is well known by those who *have* given the subject any attention, that the point at which ebullition takes place, called the boiling point—though varying for different liquids—is always constant for the same liquid under the same circumstances, being uniformly for water, (under ordinary circumstances in an oven vessel) two hundred and twelve degrees of Fahrenheit's thermometer.

It is a general belief among cooks, I find, and many excellent housewives, that the process of boiling can be hastened, or, to use a kitchen phrase, "hurried up," by extra fuel; or, in other words, they believe the more the water in the kettle bubbles up, the faster does the boiling progress. Now, what I wish to impress on the minds of those who thus believe, is this: that "water which *just boils*, (or which has reached 212° F., whether it boils or not,) is as hot as it can be possibly made in an open vessel; and all the fuel which is used in making it boil with violence is *wasted*, without adding in the smallest degree to the heat of the water, or expediting, or shortening the process of cooking a single instant: that it is by the *heat*, its intensity, and the *time of its duration* that food is cooked, and not by boiling, ebullition or "bubbling up" of the water, which has no part whatever in the operation."

I presume that the great majority of persons for whom this article was intended, will be impressed with the truth of the above assertions at sight; but if there be any who doubt, they can easily put them to a demonstration.

1st. Let a thermometer be placed in an open kettle of cold water, and the temperature raised to 212 F., and then, by adding any amount of fuel, satisfy yourself whether it can be raised a degree higher.

2d. To determine whether boiling is at *all necessary* to cookery, let a piece of meat, for instance, be placed in what is commonly known as "'Papin's Digester,' a boiler whose cover is screened down with so much nicety as entirely to prevent the escape of steam. In this vessel, boiling, (which is nothing but the escape of steam in bubbles,) is absolutely impossible; yet, if the heat applied be such as

would raise an equal amount of water in an open vessel to the boiling point, the meat will not only be done, but it will be found to be dressed in a *shorter time*, and much *better* than in an open kettle. By applying a still greater degree of heat to the digester, the meat will be so much done in a *few minutes* as actually to fall in pieces, and even the very bones may be made soft."

The subject of this article may appear a matter of small moment to some of your readers, and were it a question of mere idle curiosity, whether it be the *boiling* of water, or simply the *degree of heat* that exists in boiling water by which food is cooked, it would doubtless be folly to throw away time in its investigation; but this is far from being the case; for boiling cannot be carried on without a very great expense of fuel, while any boiling hot liquid, by using proper means for confining the heat (and why not get into the use of such a boiler as I have mentioned, here on the prairies?) may be kept boiling hot for any length of time without any expense of fuel at all." Says Mr. Sanderson, of the Franklin House, Philadelphia, (and he ought to know,) "The waste of fuel in culinary processes, which arise from making liquids boil unnecessarily is enormous; there is no doubt but that much more than half the fuel used in all the kitchens, public and private. in the whole world, is wasted precisely in this manner."

OBSERVER.

Tolono, June, 1858.

Mealy Potatoes all Summer.

It has always been difficult to keep potatoes "mealy" after warm weather comes on. The starch in them becomes changed—the sprouts start and the potatoe becomes a waxy, watery thing, hardly fit to eat.

We clip the following proposed mode of preserving them in good condition for the table, from the "Homestead." We have never seen the experiment tried. If rhe process will accomplish the object it will be valuable.

"If your readers are aware of the following process, which I am informed by Dr. J. M. Wilson is practiced in Scotland, I presume they will have no objection to give it a second perusal, and to make the experiment at least on a small scale.

"Diluted ammoniacal water in the proportion of an ounce of the liquor of ammonia of the druggists, to a pint of river or rain water, has of late years been successfully employed for checking the vegetative power of potatoes, and prolonging their suitableness for food. Potatoes immersed four or five days in this liquid, retain all their edible properties unimpaired for a twelve month, improved in flavor and mealiness. The effect of the liquid is to consolidate their substance and extract their moisture. After immersion, the potatoes should be spread so as to dry, and will then keep good for ten months; contributing in this way not only to the comfort of families, but also to the health of mariners exposed to long voyages at sea.—*Forrest Shepherd.*

Progress of English Agriculture.

Amid the general progress of which we hear so much now-a-days, probably no one department of human industry has advanced more rapidly, or with more beneficent results, than that of agriculture—especially in Great Britain. A retrospect of the last hundred years illustrates the truth of this remark in a very striking and interesting manner. Such a retrospect is furnished in the April number of the London *Quarterly Review*. It could be read with profit by every farmer in the United States. Not only would it impart many valuable hints, but it would demonstrate to every tiller of the soil the great pecuniary (not to mention public) advantage that would result from a close study of the nature and peculiarities of soils, the best methods of raising and improving stock, and other important details of his profession.

In the article in the *Quarterly* to which we allude, it is stated that at the close of the eighteenth century the condition of agriculture in England was mean and depressed. Wheat, in many districts, was rarely cultivated—and rarely eaten by the laboring classes. Rye, oats and barley were the prevailing crops. A naked fallow—that is to say, a year of barrenness, which has too often a year of exhausting weeds—was the ordinary expedient for restoring the fertility of the soil. Farm yard manure, exposed to the weather, was almost the only fertilizer. Artificial grasses, with beans, peas and cabbages, were rarely grown; and turnips were confined

to a few counties, where they were sown broadcast. Cultivation was performed almost entirely by manual labor, and farm implements were rude and inefficient.—The cattle were chiefly valued for their dairy qualities or their powers of draft, and were only fatted when they would milk or draw no longer. The greater number of breeds were large-boned and ill-shaped, greedy eaters, and slow in arriving at maturity. Fresh meat, for 6 months in the year, was a luxury only enjoyed by the wealthiest personages.

Such was the character of English husbandry at the close of the last century.—Now, as our readers well know, England produces the most abundant and varied crops, and has almost attained perfection in her stock, whether for the dairy, the shambles, or for draft, and labor saving machinery is employed to a greater extent in farming than in any other country in the world. The causes, however, that were to produce this wonderful improvement, were even then in successful though limited operation, especially in the county of Norfolk The first important step in the right direction appears to have been taken shortly after the year 1730, by applying marl to sandy lands, by the help of which boundless wilds of rabbit warrins and sheep walks were converted into rich grain bearing soil. Coincident with this improvement was the introduction of the cultivation of the turnip, which proved quite as important as the use of marl.—Turnips answered the purpose of a fallow crop, which cleaned and rested old arable lands; they were food for fattening cattle in winter; grown on light land and afterwards eaten down by sheep, which consolidated it by their feet, they prepared the way for grain crops on wastes that had been previously given up to the rabbits. By this means the sands of Norfolk, Nottinghamshire, and Bedfordshire, with the help of marling, and the heaths and wolds of Yorkshire and Lincolnshire were gradually reclaimed and made productive.

Another improvement was the system of rotation of crops that was established. Its cardinal principle was never to take two grain crops in succession from one piece of land. The importance of alternating grain with other crops was not only ascertained, but also that there was a peculiar advantage in having barley follow the turnips, clover the barley, and wheat the clover, inasmuch as the fibrous roots of the clover were the finest possible pabulum for wheat. All these changes were brought about between the years 1730 and 1760, but they were confined, with slight exceptions, to Norfolk county, and it was not until the year 1760, through the labors of Arthur Young, that they began to penetrate into other districts, although they have since been universally adopted.

The first English farmer who made a science of breeding stock was Robert Bakewell, who established the admirable breed of Leicestershire sheep. He was a plain yeoman, whose peculiar genius in this respect was made known to the world by Young. He chose the animals of the form and temperament which showed signs of producing most fat and muscle, declaring that in an ox all was useless that was not beef; and that he sought, by pairing the best specimens, to make the shoulders comparatively little, the hind quarters large; to produce "a body truly circular, with as short legs as possible, upon the plain principle that the value lies in the barrel and not in the legs," and to secure a small head, small neck and small bones. As few things escaped his quick eye, he remarked that quick fattening depended much upon amiability of disposition, and he brought his bulls by gentleness to be as docile as dogs. Mr. Bakewell's views met with a good deal of opposition, inasmuch as large boned animals were popularly reckoned the best. There were some, however, sagacious enough to appreciate his ideas, and the result has been the establishment of the superior breeds of cattle of the present day.

The new system of fattening sheep, by feeding them with sliced turnips and oil cake, was not introduced till 1824, when it was found that they could be fattened for market by this means in twelve months less than the usual time. At first it was looked upon as an extravagant and ruinous experiment; but the improved feeding, coupled with the natural tendency of the improved breeds to early maturity, has multiplied to an enormous extent the amount of mutton produced. Twenty years ago the majority of the sheep brought to the Smithfield market were

three and four years old. Now a three year old sheep is scarcely to be met with, and fat sheep only a twelvemonth old are plentiful. Results of a like nature have followed extra-feeding of other animals for the butcher.

The later improvements bearing on English agriculture, have been the introduction of a remarkable system of drainage, the employment of artificial manures, the improvement of implemen s, and by no means last, the institution of agricultural societies.

Up to the year 1843 but little had been done in the way of drainage, although attempts had been made from the earliest times. The most that had been done was the tapping of springs, or endeavoring to convey away the rain which fell on the surface by drains so shallow that the plow often spoiled them. By the year 1843, a Mr Parkes, who devoted much attention to the subject, had demonstrated, after several years of experiment, that four feet should be the minimum depth for drains in wet or clayey lands. He found that a deep drain began to run after wet weather, not from the water above, but from the water arising from the subterranean accumulations below, and that, by drawing away the stagnant moisture from the three or four feet of earth next the surface, it was rendered more friable, easier to work, more penetrable by the rain, which then carried down air and manure, and much warmer and more suitable for the nourishment of the roots of the crops. This discovery was rendered available by the invention of clay pipes for the drains. and it is asserted has more than doubled the value of retentive soils in England. Some idea of the immense extent to which drainage is there carried, may be inferred from the fact that since 1845, two parliamentary loans, each of four millions sterling, have been granted to landholders to enable them to drain their estates, while it is estimated that eight millions in addition have been loaned by private capitalists for the same purpose.

The English farmers have also, of late years, employed large quantities of special manures, embracing lime, chalk, gypsum, marl, soot, salt, saltpetre, rapecake, bones, nitrate of soda, guano, and other substances. The first cargo of guano was introduced somewhere about 1835, and since 1839 twelve millions sterling have been paid for this article alone. In 1837 the value of foreign bones imported was £250,000; and since 1840, £1,000,000 at least has been paid annually for bones, sulphric acid, and artificial manures, independently of guano. Agricultural chemists have also been largely employed and handsomely paid for analyses of soils, manures, and similar investigations. And English farms have now reached such a high pitch of fertility through this system of intense cultivation, that the soil has become almost too rich, and the farmers are in consequence returning to the once condemned system of two grain crops in succession

To the above might be added interesting quotations concerning the employment of machinery by English farmers, and the influence of railways and agricultural societies, as well as many details of the marvelous success which has attended the efforts of our English brethren to obtain from the earth the greatest amount and best quality of food for the least money; but suffice it to say, that they have proved that a liberal use of money, when judiciously applied, is the best economy and the surest road to wealth; for even the tenant farmers of England have amassed and are accumulating at this day, fortunes such as American farmers scarcely dream of.

The Heaviest Bullock ever Butchered.

Upon the authority of the President of the American Institute, it was recently stated that the heaviest bullock butchered in this country, was the ox Washington, whose gross weight was 3,204 lbs., and weight of beef 2,174 lbs. This claim appears to be disputed, however, by some writers in the *Tribune*, from Pennsylvania, one of whom claims that a bullock was butchered near Lancaster, on the 22nd of February last, whose live weight was 3,387, net 2,409; the other that a Berks county ox was butchered some years ago in Philadelphia, whose live weight was 3,350, net 2.388. A still heavier bullock is announced in the *Saratoga County Press*, which says "that J. M. Cole, of Saratoga Springs, slaughtered an ox in 1847 whose live weight was 3.520 lbs.; dressed 2.567." If this be true, Mr. Cole has probably beaten the world, and should give the world the proof.

A Day at the Astor House Farm.

To the Editor of the Boston Journal:

One of the institutions of New York is the Astor House farm, located in Union, N. J., about seven miles from this city. It is owned by Mr. Develin, the son-in-law of Gen. Stetson, who generously fitted up his farm for the exclusive use of the Astor House, conducted by his father-in-law, convinced that it would pay him well; and the result has more than realized his expectations. The ride to it over the Hoboken ferry is one of the finest in all this region. The scenery is exquisite—the road is in elegant order. New Jersey is one of the best farming States in the Union, and the evidence of thrift and high culture meets one on all sides. Near the landing at Hoboken is the harbor of the New York Sailing Club. About twenty vessels of the fleet lay here at anchor. So many elegant sailing craft cannot be seen together on the continent elsewhere. The Wanderer, so recently under the seizure of the U. S. officers, on the charge of being fitted up for the slave trade, attracts great attention. She is an elegant vessel, the fastest sailer in our waters, can accommodate nearly two hundred slaves, and the public suspicion is by no means allayed in regard to accommodations and her destination, though she has been released by the U. S Marshal.

In passing on to the farm we traversed the marshes, containing thirty thousand acres of land, now a mere swamp. A patch here and there under cultivation indicate what this waste would become under the hand of tillage. This vast tract could be now purchased at about $50 per acre. The farmer soon would redeem it from waste. It could be made like a garden; and as it is not four miles from the city, it would afford a supply of all the vegetables for New York. A part of it has been made a nursery by Mr Justin, the planter of the Central Park, and his trees flourish like the "green bay tree" of the olden time. No "bottom" on the Mississippi can equal this in richness—nor will it long remain a waste.

Once on the farm the cattle attract the attention of the visitor. The stable is on a novel plan and ingeniously fitted for the purpose of its erection. Fifty cows stand before you all in a row, and the reputed taste of the host of the Astor is not lessened by the appearance of the cattle. The stables are sweet and clean as a dairy. These cows are fed on the sweetest hay and the best of meal and are groomed daily as a horse would be, and roam in clover fields all the summer. They are fed on cotton meal. By the invention of a gentleman whose name I do not recollect, the fuse has been taken from the cotton seed and the meal makes the best food for cows, better than linseed, corn meal or any other. The cotton meal goes to milk first, then to meat, and lastly to fat. From these cows four hundred quarts of milk per day are carried into the Astor for the use of the guests. The cows are milked at 3 o'clock each morning, and the milk reaches the Astor in the cool of the day, and from the milk taken at night, twenty-five quarts of pure cream are sent in also for the daily use of the house. An ice house of a novel arrangement, with ventilators and a cooling chamber, receives the meat and vegetables. Milk can be kept sweet a week and fruit for a long time. In these days of swill milk and terror, such a dairy as meets the eye here is a welcome sight

Next we come to the piggery. An immense building, cruciform in shape, with a cupola like an academy, indicates where the pork of the Astor House is raised. Here six hundred hogs are annually raised for the slaughter. Each hog has his parlor, his yard and sleeping apartment to himself, while being corn-fed and ready for the market. Attached to the house are seven acres of land, dotted with small houses, into which the pigs may run and be safe, and here the broods luxuriate on hill and dale, heat and shade. A railroad car runs from the house where the food is cooked to the pens, and the food is trundled in on the track, and by a simple contrivance, all the hogs are compelled to wait till the food is served before they can help themselves. The swill from the Astor House is taken away before daylight each day, so that no one is annoyed A cart perfectly tight stands in the yard of the Astor House all day and receives all that is placed in it. Another, its fellow complete, is driven in at early morn, all sweet and clean, and the full one is taken out and the empty one left in its place. This swill is taken to the farm, and in an im-

mense vat is cooked for the swine. In the process, all the fat and greese that rises is taken off. Gen. Stetson has kept the Astor twenty-one years next July. The swill from the house has been sold and removed for the sum of $500 per year. The farm has made this discovery, that the grease that rises from the cooking of the food of the hogs, independent of the food, is worth annually, and brings the snug little sum in cash of $3600. Pigs noble and plebian, are here; pigs English, pigs Chinese, pigs Siamese. A smoke house completes the porkery of the farm. A man is employed to take care of this department—he does nothing else—and a house and grounds are given to him.

Next we advance to the poultry house—probably the most perfect in the land. The building is 240 feet long, and is of two stories. The "roost" is divided into four apartments; the roost frames are sassafras, to keep out vermin; apartments for laying, setting, &c., are in great perfection. A perfect system is adopted; each setting hen is removed, and her nest cleansed each day, and at regular intervals she is compelled to take an airing. About 2000 eggs per day are ready for the house, and, with the system of warming the building, the hens lay in the dead of winter, and fresh-laid eggs can be had at one season of the year as well as another. Attached to the hen house are seven acres of land, carefully inclosed, where the chickens and their associates have the "liberty of the yard." Each hen with a brood has a house in the field exclusively her own, and each day the house is moved, as that removal makes the rats and other vermin think it is a trap, and so they keep out of it. Here 30,000 poultry are raised a year. The chicken department is under the charge of a gentleman, trained in England under Lord Northup, and the fifteen years' experience in the old country is well used here. The lofty hall over the roost is devoted to the final feeding of capons for the table. Each of the 2000 fat capons, that are to be honored with a revolution on the spit of the Astor House kitchen, have here their final preparation on the "corn of the land." Here, also, is to be placed an incubator, of the newest model, where, by the means of hot water, chickens are cheated into life; and after they come out, they are clapped into another machine called "the mother," where, for the second time, they are awfully deceived with the idea that they are under the motherly care of an old hen. Six hundred eggs can be hatched at one time, and the total of chickens that will probably see life under this novel method, is not far from 12,000 per year.

The turkey yard comes next, from which 300 turkeys per year come forth. And then an immense tract—five acres—watered by a running brook, eminently suggestive of trout, is called "Duckville," in which the ducks and geese, in countless numbers, are fattened for the table Besides, there are acres of strawberries, which are picked at the rate of one cent per basket; and a good picker can realize one dollar per day. All the luxuries of the hotbeds, all the flowers, fine herbs, celery, grapes, pears and apples that may be needed for the table—with acres of potatoes, corn, beets, and all the roots used for food, grow on the farm. Hay in vast quantities, and beef, fattening in the stalls, meet the eye.

At the head of this model farm stands Major Fornet, who was Kossuth's Chief Engineer; and the condition of the farm indicates that he is as able in the plowed as in the "tented field." Sixteen men, four horses, two stout mules, an overseer of the poultry, geese, hogs, each man with a house to reside in, a general overseer under Major Fornet, comprise the working force of the farm.

It is the centre of general attraction. The setting down among the staid old farmers of Jersey, who for centuries have done their farming after the good old fashion, of such a system of agriculture as the Astor House farm displays, and with such tremendous result—the idea of feeding animals, keeping them warm and clean, not only having good light barns, pens and houses, but actually warming them with coal, so as to be really comfortable for a man, produced at first ridicule, then surprise and astonishment, and then imitation. The farm is visited by all persons for miles around; and when Major Fornet shall have had time to perfect his plans, arrange the strawberry bed of acres of ground, bring out his fruit, set up his bone mills, and complete fully his various houses and villages in which the tribes under his charge reside and grow fat, it will be one

of the great attractions to all who love successful farming, system and beauty in arrangement, and splendid scenery; and as the ride towards it is one of the best in all this region, it will attract great and general attention; and the eminent success of this experiment will probably induce many other hotel keepers to attach a farm to their palace hotels. It costs not far from ten thousand dollars per year to work this farm. The fruits of the farm, at the lowest estimate, is not less than fifty thousand dollars per year, beside the attraction that must attend a hotel that in the centre of such a city as New York can guaranty to its guests such milk, cream, eggs, poultry, pork, and vegetables, that grow under the eye of the host, and are watched as carefully as the ledger or the cash in the safe. BURLEIGH.

A Long Island Prize Farm.

The Genesee N. Y. Farmer tells a pretty good story of a farm, thus:

In 1851, and also in 1852, the American Institute awarded the first premium for the "best cultivated farm of one hundred acres" to E. H. Kimball, Esq., of Flatlands, Kings county, Long Island. The early part of last month, we had the pleasure of visiting this justly celebrated farm, and think a brief account of it may not be uninteresting to our readers.

The farm contains a little over one hundred acres of arable land, and is situated about eight miles from New York, on the shore of Jamaica Bay, which affords easy communication with the city by water.

The soil is an exceedingly fine, friable loam, with a thin layer of clay lying on a gravelly subsoil, which affords excellent drainage. There is not a stone on the farm. From its peculiar location, sea weed and drift can be had in great quantities, and they are placed in the cattle yards, where they are converted into excellent manure. A considerable quantity of manure is also brought from New York. This is made into a compost with the manure of the farm, muck, leached ashes, bone-dust, etc., the heap being covered with sea weed and drift, which absorb the ammonia. The heap is turned once or twice till it is thoroughly rotted, and so fine that it can be spread with a shovel without adhering to it. The manure is applied wholly to spring crops, and Mr. K. is undoubtedly right in decomposing it as much as possible, as in such condition it acts with great rapidity, and pushes the plants forward during the early stages of their growth. He attributes much of his success to this method of composting manures; but it must not be forgotten that the soil is naturally rich, and also that manures are used with great liberality.

The principal crop raised on the farm is potatoes, the main object being to get them early, while they command a high price. They are planted in rows three feet apart, and from ten to twelve inches in the rows. The land is first ploughed and harrowed till in fine tilth; drills are then opened, and a sprinkling of Peruvian guano—say 50 lbs., per acre—scattered in the drills; the thoroughly rotted, composted manure previously alluded to, is then spread in the rows, and the seed planted on the manure and covered with the plough. Before the potatoes make their appearance, the land is harrowed for the purpose of breaking the crust and killing the weeds. The cultivator and plough are frequently used, and at the time of our visit nothing could exceed the cleanliness and mellowness of the ground and the luxuriousness of the crop. The varieties mainly planted are the Early June and Blue Mercer. The former are dug and sent to market before they are fully ripe, and are sold at a very high price. As soon as the early potatoes are dug, the land is planted with cabbage, celery, spinach, or ruta bagas. Celery is very profitable, and the necessary deep tillage and heavy manuring render the soil exceedingly fertile for subsequent crops. Mr. K. had four acres of celery last season, and intends to plant ten acres the present year.

Mr. Kimball has two rows of hot-beds, each row about two hundred feet long and nine feet wide, covered with sash. From these beds he has sold this spring over $300 worth of lettuce, and the beds at the time of our visit were occupied with cucumbers, $200 worth having been already sold.

A few acres only are sown with wheat—but such wheat we have not seen elsewhere the present year. It is the Mediterranean. Mr. K. formerly sowed the Bergen wheat, a variety originating in the neighborhood. It appears that Mr

Bergen discovered a single head of this variety growing in a field of wheat. He kept it separate, and soon raised enough to furnish seed for himself and neighbors. It was known as the White Bergen, and has frequently taken prizes at the Fairs of the American Institute. Unfortunately, during the excitement in regard to the Australian wheat, a few years ago, the Bergen was abandoned, and now none can be found. It was an early and everyway excellent variety, and far superior to the Australian, which, in fact, is now little cultivated.

In conjunction with understanding, judicious manuring, and good cultivation, an early and productive variety of wheat of good quality would do much towards enabling us to bid defiance to that terrible pest the wheat midge, and the history of the Bergen wheat should stimulate us to greater activity and hopefulness in our endeavors to discover such a variety.

The crops of timothy and clover on this farm were very fine. The land is seeded down with wheat—the timothy being sown in the fall and the clover in the spring. When the land is once stocked, it is allowed to remain in meadow as long as it will produce, without top dressing, two tons of clean timothy hay per acre, which it will generally do for five or six years. When ploughed, it is planted with corn, followed by potatoes, with a second crop of cabbage or turnips. The next year it is also planted with potatoes, and is then sown with wheat and seeded down. Each crop is well manured, except the turnips.

All the stock on the farm is soiled in the yards during the summer—a practice which affords a large quantity of excellent manure, and enables the farmer to dispense, in a good degree, with fences. Of course, it does not follow, because soiling is profitable on a farm contiguous to a large city, where labor is cheap (Mr. K. pays his men from $5 to $10 per month and board) and produce high, that it would pay where land and produce are cheap and labor dear.

Sugar beets, carrots, parsnips, and other roots, are extensively grown as food for stock. They are all sown in drills, after subsoil ploughing, and are heavily manured in the drills, great care being taken to have the manure thoroughly rotted and intimately incorporated with the soil.

The profits on this farm are full fifty dollars per acre; and Mr. K. says he shall not be satisfied till his hundred acres net him $10,000 per annum!

But the excellent system of cultivation so successfully and profitably adopted on this beautiful farm, is not its only feature of interest. We have seldom seen, even in England, a more charming country residence. As you approach the place, an American Arbor Vitæ hedge and an avenue of Ailanthus trees indicate more than ordinary taste. No high walls or exclusive lodge frowns on the weary, dusty traveler. He finds the gate hospitably open wide, and enters the admirably laid out and well kept grounds between two noble specimens of that handsomest of hardy evergreens, the Norway Spruce. Each step along the finely gravelled carriage way reveals some new view of the beautiful lawn in front of a large and homelike country house, surrounded on three sides with a piazza, the pillars of which are encircled with sweet-scented honeysuckles. Let us stop and look at these fine Paulownias, shedding their large blue flowers in rich profusion on the close mown grass; here is the delicate Persian Lilac, and there the rough but handsome Pyrus Japonica; to the right is the trunk of a dead Maple tree covered with graceful vines, and in that clump of evergreens nestles a cozy arbor. How pleasing to the eye are these American and Chinese Arbor Vitæs! how handsome those Austrian and Weymouth Pines! Delicious is the fragrance shed by these European Lindens on the ocean air. How handsome and graceful are the pendulous American Elms! how beautiful those Sycamores, Laburnums, and Magnolias! what fine beds of Geraniums, Fuchsias, and Verbenas! Who would reside in the city, even in a mansion on Fifth Avenue, when he could retire from the hum of Broadway and the excitement of Wall street to such a scene as this.

Ruta Bagas and Other Root Crops.

The time is approaching for sowing roots, and perhaps the following may be an inducement for those that have not as yet grown any, and who therefore are ignorant of their value. I shall show them what can be done by bad treatment, and in an unfavorable season.

Last June I had a piece of ground that we could not get into a fit state for corn. I therefore determined to have a crop of roots, and the only preparation it got without manure) was plowing, harrowing and rolling. I drew the drills thirty inches apart with the corner of a draw hoe; a man will run his hoe along as fast as he can walk, and straight enough after one straight line is made. I then sprinkled a little super-phosphate of lime along the mark so made, this being sufficient to give the seed a quick start, and set a couple of quick-walking men to sow it in the following manner: Take some seed between the fore-finger and thumb, about as much as you take on the end of your finger when looking at clover seed, and drop three seeds a foot apart, carefully keeping the thumb and finger in motion, and walk quick; half a dozen seeds will perhaps drop in one place, and then perhaps but two, but this is evener and better than I can get a drill to do it. This is a quick way, for the men will try who can get out first, and you can conclude the quicker they move the evener your seed is going in. When all is sown, I set them at one end of the field, and get them to "herring bone" it which is done by placing the two heels together, and moving the right heel into the hollow of the left, and *vice versa*—the closer the heels are kept together, the better the seed is covered. The hands should be placed behind the back crossed, which enables the worker to move along quicker and with more ease to himself, it being as a balance to the body. This is a light covering, but all that is necessary for turnips; I then run the roller over them and they are finished.

When they have made their rough leaf, I run Knox's horse hoe through them, to keep the weeds down and keep the plants growing. When the plants are about four inches high, I set the hoes on to thin them, they being about the distance you want them from this method of sowing; they cut each side, which takes your extra plants out, leaving but one plant standing. When they are done thining, set on your horse hoe again to loosen your soil, this is all the hand hoeing you want if you keep the weeds down, as the use of the horse hoe afterwards will throw a sufficiency of loose mould between the plants, which will smother the weeds until such time as the size of the leaf or leaves occupies the space between them, when there is an end to weed growing. I raised on this piece (one acre) of ground on which we could not at that time (since drained) grow any other crop, nine hundred and thirty bushels of ruta baga turnips, which has been a great saving the past winter to the corn crib. I fatted one pair of oxen, and kept upwards of twenty head of horned cattle on them and mangel wurtzel, clover hay, straw, and cornstalks; I am now feeding ruta bagas.

My object in stating the above, is to show farmers that root crops are not so extra hard to raise, and that they can raise them to advantage without using up their best land, and costing too much for the working of them. Root crops are objected to, as being too expensive to raise. I have always found that such objectors are men who never raised any root crops, and know nothing about them. A man who has tried them once will repeat the practice.

As for their tainting the butter, it is all moonshine, and another excuse for not growing them. If a man wishes to have his butter taste turnipy, he can very easily effect, and as easily prevent it.

When the above amount can be taken off with such bad treatment, they can see what can be done by good treatment, which consists in plowing your land two or three times, harrowing and rolling as often as necessary to get a good tilth, with a proper quantity of stable manure applied broadcast, or drilled in when scarce. In drilling manure in, I open drills same as for planting potatoes, laying the manure in the bottom, turning the drills over as before; then run the harrow with the teeth up crosswise, or an old gate, which levels the earth and still leaves it sufficiently high that the rows where the manure is can be seen to sow on; then roll, keeping your ground level, as turnips and mangel wurtzel will not do here on raised drills, as in Europe. Our sun is too strong, and when on drills, as fast as the roots come to the side they are burnt up, and the crop spoiled. In Europe they cultivate all on drills, but theirs being a moist climate, their object is to draw the roots out and keep them dry, while our object is to supply as much moisture as we possibly can, and we can only get it by growing them on a level surface. Bone dust is the best

special manure that can be applied to the turnip crop; I have used it at the rate of fifty bushels to the acre, and found it to pay; you can have your ground too rich for turnips, which must be guarded against, as if that is the case they will run all to tops and no bulbs—I have seen several instances of this. If you think your ground is too rich, do not sow turnips; instead of them, mangel wurtzels; for this crop the richer the ground is the better, as it costs as much to work a half crop on the same piece of ground as it does a whole one.

Newton, N. J. G. Howatt.

[*Country Gentleman.*

From the Country Gentleman.

How to Protect Vines from Bugs.

Messrs. Editors.—Notwithstanding the fact that a great many methods for the protection of vines from bugs have been proposed, and several practiced successfully, still there are some farmers who have "no luck" in raising cucumbers, melons, squashes, and that tribe of vegetables. As several of the methods proposed have gone the rounds of the papers, this want of success may seem as surprising to others as it certainly was to ourselves, when we discovered it by some recent conversation with farmers of no mean name, albeit rather poor gardeners. The explanation of this rather surprising want of success in raising vines, and of a want even of a knowledge of how to go to work to protect them from bugs, may be in many cases what we have found it to be in one, viz: that the plans which were proposed in the papers were either impracticable in the hurry of spring work, (such as making boxes,) or that they were published at a wrong time of the year, and forgotten when the right time came in the succeeding season.

"If I could only remember," said one of these good farmers but poor gardeners, "if I could only remember at the right time even the half of the plans which I have heard of or read of, I presume I could fix upon the one which is best suited to my case, and be prepared in season to fight the little pests. But I cannot remember anything of the kind, save perhaps either something which is too troublesome, or something that appears to me quite likely to be of no avail."

"Why don't you, then, refresh your memory by referring to the index of the *Cultivator*, which you have taken now for several years?"

"Oh! somehow or other one or more of the numbers of the paper get a missing before the index comes with the last No., and so I have never got any of them stitched together in book form. I have frequently thought I would stitch all the Nos. of a volume together, but somehow the loss of one of them, or some other hindrance, has always prevented me."

"I guess I could, by a few minutes' work, call to your remembrance all the various plans which have been proposed or mentioned in any way for several years—at least since the commencement of the present series of the *Cultivator*."

"I wish you would, if not too much trouble, and then I will adopt the one which I think will be most effectual or best suited to my circumstances, for, like most other farmers, I have not a great deal of time to fix and fuss with my garden, in making boxes, &c., &c."

Accordingly I consulted each volume of the Cultivator since the commencement of the present series, and in the following notes you have the result of my researches, which you may lay before your readers, as there may be several among them who would like to see such an epitome, as much as the *one* for whom it was originally made.

In Cult. 1853. p. 187, D. M. W. states that if boxes from 15 to 18 inches square, and 6 inches high, without top or bottom of course, are placed on the hills before the plants are up, "a striped bug will never touch them."

In Cult. 1854, p. 187, it is stated that the *best* way to protect vines from bugs, is to cover a simple square wooden frame with millinet, and set it over the plants, pressing it gently into the ground. They may be got rid of, also, by a persevering use of the finger and thumb, two or three times a day, for two or three weeks.

In Cult. 1854, p. 279, A. Walker, of Oswego, states that he does not plant squashes, &c., until weather and ground are so warm that the plants will not be stunted in their growth, and that he arranges usually so as to have a brood of chickens to put in his yard of vines. His

bugs thus serve as chicken-feed, or as a source of profit rather than loss.

In Cult. 1854, p. 217, S. states that applying soot, ashes, &c., is all in vain, and a humbug; and that the use of boxes covered with oil gauze, or glass, is the "only way."

In Cult 1855, p. 129, it is stated that squashes, from which the bugs had for some days stripped nearly every leaf, were saved by the application of a handful of guano around each hill, avoiding the plants. "In 24 hours not a bug was to be seen, and the plants grew rapidly and bore a heavy crop." (Other fæted odours will repel bugs.)

In Cult. 1856, p. 234, E. Kalb states that after trying hen-coops with broods of chickens among the hills, soot, ashes, Scotch snuff, &c., he has found no plan so effective as "crushing the wretches with the fingers."

In Cult. 1857, p. 277, it is stated that Wm. Saunders has found that the striped bug may be successfully repelled by simply placing a pane of glass over each hill, supported at the corners on four small wooden pegs. He says this has been found as effectual as the wooden box, while it freely admits air as well as light.

In addition to the above, we find in the *Country Gentleman*, for the same years, mention made of the following plans: Dipping feathers in turpentine, and sticking one or more in a hill, to be renewed after showers, a plan which is said to have been used successfully for thirty years; boxes covered with thin cotton cloth of any kind as superior to glass, the plants being less likely to be scorched with heat; boxes without any covering as superior to those covered with glass or cloth, the plants being less delicate and less likely to be injured when exposed; and a variety of foul odours, as of onions, tomatoes, cow-dung, &c.

From among the above, every reader may select the one which may seem best suited to his circumstances; try it and report. OBSERVER.

What England Eats from Abroad.

The recent returns of the English Board of trade for the year 1857, are revived in the London *Field*, The importation of wheat showed a very large increase in the amount brought from Prussia, a large decrease in that received from Danubian provinces, and a very heavy falling off in American imports—the inducements as regards price not having been sufficient to draw our large surplus across the water. The importation of barley in 1857 was nearly two and a half times that of 1856; oats also show considerable increase, but Indian corn a large diminution. The total importation of wheat-meal and flour for the year 1857 was 2,178,148 cwts, while for 1856 it was 3,970,100 cwt., thus showing a diminution to the extent of 1,791,752 cwts. Among stock and other importations for three years were:

	Cattle.	Calves.	Sheep.	Swine.	Eggs.
1855	73,750	23,777	162,642	1,217	99,782,800
1856	61,862	21,444	145,059	9,916	117,230,600
1857	65,648	27,315	177,207	10,677	127,039,600

Guano shows an increase from 191,501 tons in 1856 to 288,362 in 1857, and potatoes the immense increase from 58,261 cwt. in 1855, and 109,838 cwt. in 1856, to 955,057 cwt. in 1857—an evidence of the havoc committed by the rot of the home crop of the year. The importation of provisions, bacon and hams, salt beef and pork, butter and cheese, was of about average extent.—*Country Gentleman.*

How to Manage a Rearing Horse.

Whenever you perceive your horse's inclination to rear, separate your reins and prepare for him. The instant he is about to rise, slacken one hand, and bend or twist his head with the other, keeping your hands low. This bending compels him to move a hind leg, and of a necessity, brings his fore feet down. Instantly twist him completely round, two or three times, which will confuse him very much, and completely throw him off his guard. The moment you have finished twisting him around, place his head in the direction you wish to proceed, apply the spurs and he will not fail to go forward. If the situation be convenient, press him into a gallop, and apply the whip and spurs two or three times severely. The horse may not, perhaps, be satisfied with the defeat, but may feel disposed to try again for the mastery. Should this be the case, you have only to twist him, etc., as before, and you will find that in the second struggle he will be more easily subdued than on the former occasion; in fact, you will see him quail under the

operation. It rarely happens that a rearing horse, after having been treated in the way described. will resort to this trick a third time.—*British Sportsman.*

The Apple Crop.

So far as has come under our immediate observation, and we hear similar reports from every quarter, the apple trees are very full of blossoms, this spring, as, indeed, are all other fruit trees, and the prospect is good for a large crop of fruit. The Portsmouth (N. H.) Journal gives the following as a mode of determining the amount of fruit that may be expected from an orchard, which may be new to many of our readers:

Some years since an old gentleman entered the orchard of his neighbor in the month of May, when the trees were in full bloom, and the trees generally filled with blossoms. After making a circuit of the orchard he remarked: "Well, I see you are to have but few apples this year." Pointing to one full of blossoms, "you will have none on that tree." Pointing to another equally full, "you will have a peck on that." Then to another, "you may have five bushels on that." Keeping a note of his remarks, it was found in the autumn that his predictions were correct. On inquiry for indications, he said that *red* apple blossoms indicated fruit, and *white* did not. The general redness of the blossoms this season is a good omen.—*Maine Farmer.*

Comparative Value of Roots for Cows.

A writer in the Connecticut State Agricultural Transactions, gives, from "a careful experience in winter feeding of milch cows," his judgment of the comparative value of roots. Carrots promote the richest milk; sugar beets are next best; potatoes follow, and turnips class last in the product as to quality, but first as to quantity They were compared as fed pound for pound. Carrots, he thinks best for small families, where they desire but a small quantity of milk, but of richest quality, and a fat, sleek-looking cow. Turnips are the best for those who sell milk, and desire to produce the greatest quantity.—*Country Gentleman.*

The Slaughter which Daily Sustains Us

When we ride, we sit upon the skin of the pig; when we walk, we tread upon the skin of the bullock; we wear the skin of the kid upon our hands, and the fleece of the sheep upon our backs. More than half the world are human beings in sheep's clothing. We eat the flesh of some creatures, of some we drink the milk, upon others we are dependent for the cultivation of the soil; and if it is a pain to us to suffer hunger and cold, we should be scrupulous to avoid inflicting wanton misery upon the animals by means of which we are warmed and fed.—*Laurensville Herald.*

From the Valley Farmer.

Alternation of Crops.

That a regular and systematic rotation of farm crops is absolutely necessary to secure the permanent fertility of the soil, and to afford to the husbandman the most profitable returns, we think can be clearly established, not only by the experience of the best farmers in this country and more particularly in Europe, but by the operations of nature herself.

It was not until about the middle of the last century, that the importance of a scientific rotation of crops began to attract the attention of farmers. Arthur Young, one of the most popular and close observers, among the British farmers, saw the importance of this difficult question in its true light; he very correctly told the farmers of his day, that whenever very good or very bad husbandry is found on arable land, it is more the result of a right or wrong arrangement of crops than of any other circumstance. More accurate and more generally diffused observations have long since led the present race of cultivators to establish a more correct theory in regard to this subject.

We need not go from our own country to find the most lamentable instances of reckless disregard of the correct system of alternation; the evidences are too palpable in all the older States of this Union. Look, for instance, at Maryland. Virginia, the Carolinas and other neighboring States, in which corn, tobacco and cotton, for fifty years or more, have been the leading crops and allowed to follow the same in annual succession upon the same lands until the returns were no longer adequate to sustain their rapidly diminishing population. Look again at some of these lands which have been abandoned by their former proprietors and purchased by a more intelligent class of cultivators, who have adopted a system of rotation and manuring, and we find them so far renovated and restored under the present system of improved and deep tillage as to yield even larger crops than when they were first subdued from the original forests. We regret, however, to say that this improved system, in its greatest perfection, is yet carried on by but comparatively few of the great mass of farmers in our land.

In regard to the general principles on which the proper cropping of land depends, it is now perfectly understood that some kinds of crops deteriorate or exhaust the land to a much greater degree than others; that some, by their capability of being consumed on the farm, (though they do exhaust the soil,) return in such consumption by the farm stock, as much and perhaps more to the soil, than they draw from it during the period of their growth. And again, that other crops, by admitting of profitable tillage and cleansing the land during their cultivation and growth, aid very much in the essential destruction of weeds, insects, &c., and in ameliorating the land for the succeeding crop; while on the other hand, different crops, by not permitting such cultivation, and being great exhausters when followed in immediate and annual succession, not only deteriorate the soil, but fill it with weeds and grubs. In the management of rotations, however, much careful attention and discrimination are requisite in the cultivator to profitably adapt them to the nature of the soil, and the circumstances under which he is placed. Above all, the farmer must remember that, as different kinds of plants require different kinds and proportions of nutritious materials to be drawn from the earth for their increase and perfect growth, so also they need different situations and conditions of soil for their most perfect developement.

Every observing farmer is well aware that certain crops never prosper well two or more seasons together on the same land—that there is a manifest falling off in the product.

Now, it is of primary importance that we should endeavor to understand, if possible, the cause of this phenomenon. This question, therefore, has long engaged not only the attention of the most sagacious farmers, but of many distinguished chemists and philosophers. By these it has been regarded chiefly in two points of view.

First, by an immutable law, nature has provided for each species of plants a specific food, suited to its organization and its wants. Thus some soils will not grow wheat, or other farm crops, although abounding in the common elements of fertility, and although they will make a profitable return in other farm crops, in consequence of their being deficient in the specific food required for the perfection of the wheat, or other particular species of crop. This is true in regard to wheat in portions of New England and other States, although once particularly productive in this grain. One family or species of plants requires a different food from that which another family or species requires, and it seems to be another law of nature, that what is not essential to one family or species, is particularly adapted to other families or species. It seems to be provided, that where the general fertility of the soil is kept up, the specific food of any class or species continues to accumulate till the return again to the same field of this particular crop. Thus it is supposed to require eight or ten years for the specific food of flax, to accumulate sufficiently for a second crop, after one has been taken from the field. Even the specific food of clover becomes exhausted by a too frequent repetition of it in the same field, it being found necessary, on some soils to substitute for it some other crops or grass, so that it may not be repeated oftener than once in six or eight years. There are exceptions to the rules of practice which these laws inculcate. Some soils seem natural to wheat, others to oats or grass, and successive crops of these are sometimes taken without apparent diminution of product, but which cannot always continue. This is undoubtedly owing to a super-abundance of the specific food in the soil which these crops require, and which will ultimately become exhausted. It is, therefore, always better to regulate our practice by general laws than by casual exceptions.

If farmers will but carefully observe the operations of these laws in nature, they will readily see the importance of an established system of alternation of crops. If we notice the grasses in our meadows it will be seen that they are subject to change.

It will, also, often be observed, that after removing certain crops from a field, and that field is allowed to remain uncultivated for a single season, an immense growth of weeds of certain kinds will spring up that had never before occupied the same ground.

The timber trees in the forest alternate—new species springing up as the old ones decay, or are cut down. For instance, in many countries, if the prevailing timber be pine, and is cut off or removed by age and decay, oak will spring up in its place; or, if oak occupy the soil, pine will next succeed, and so of many other varieties. In forests of a more mixed growth, as in Kentucky and some other western States, this change goes on, though from the great variety of timber, it is less apparent and striking.

That the subject may be the more clearly understood, the generality of tillage crops have been reckoned under two heads or classes, differing essentially in their character, culture and exhausting influence upon the soil. These two classes are denominated *culmiferous* crops, and *leguminous* crops. The first is so named from *culm*, the stalk or stem, such as are usually hollow and supporting the leaves and seeds. This class includes wheat, barley, oats, rye, Indian corn, tobacco, cotton, &c. These are particularly exhausting in the production of their seeds, and hence are sometimes termed "robbers," or exhausters of the soil. If these are cut green, or while they are in blossom, they are far less so.

Leguminous crops, literally, are peas, beans, and other pulse, but here the class is intended to embrace all which are considered ameliorating or enriching crops, as potatoes, turnips, carrots, beets, cabbages and clover. These

latter are not only less exhausting than the culmiferous class, as most of them do not mature their seeds, and all, on account of their broad system of leaves, draw more or less nourishment from the atmosphere, but they improve the condition of the soil by dividing and loosening it with their tap and bulbous roots. For these reasons they are called ameliorating or enriching crops, and when they receive manure, as they should, and culture after the drill system, they are peculiarly adapted to improve and fit the soil for the culmiferous class of crops. No correct and profitable system of farming, therefore, can be carried on where the culmiferous and leguminous crops do not alternate or follow each other in succession, except when grass is made to intervene, and it matters little which crops are selected from the two classes. But the interest of the farmer will determine this. With us, in the West, clover must be the chief reliance in extensive farming, though potatoes, in some sections, may come in to advantage.

From the character of our crops and their peculiar adaptation to our soil and climate, our system of rotation must necessarily embrace a less number of years, and be the more frequently repeated than in England and other countries of Europe, where Indian corn is not grown, and where the various root crops are so important to successful husbandry, hence the greater necessity with us of adhering to the best system that can be adopted, and bringing in clover or its equivalent, as often as every four or five years. Indian corn, rye, buckwheat, &c., may be sown and turned under, while green, to great advantage, as ameliorating or improving crops, and requiring less frequent repetition of clover.

Second.—In addition to the exhausting nature of certain crops, it is contended by many intelligent cultivators and vegetable physiologists that each plant has certain peculiar excretory matters, which it constantly deposits in the soil in which it is grown—matters which are supposed to be particularly noxious to other plants of its own species—that in consequence, (until these are decomposed and removed from the earth by other plants or by the gradual effects of decomposition,) the same crop cannot advantageously prosper in the same soil. There are numerous facts that seem to go to the support of this doctrine. It is known that water in which plants and other bulbs have been grown will not support other bulbs of the same kinds in a flourishing condition; yet still, that such impure water is found to be more grateful than clear water to vegetables of another species.

We once planted two acres of Ruta Baga turnips on a piece of new Kentucky "barrens," of superior quality; the turnips grew well and made a fine crop. The next year the whole field of forty acres was planted with corn; the two acres on which the turnips grew was almost a total failure, the corn throughout the whole season looked yellow and sickly, while the remainder of the field produced an excellent crop. As we have said before, flax cannot be cultivated to advantage on the same land only at intervening periods of several years. Yet from chemical tests neither turnips or flax are regarded as very exhausting crops, but the aversion of the same, or certain other crops to grow immediately on the same soil arises from these excretory matters deposited by the previous crop.

Another fact should be known, and that is, that an orchard of fruit trees will never prosper well on the site of an old orchard of similar fruit. This is true of apples, but more particularly so of peaches. Neither will apple trees flourish so well when rows of peach trees are planted between them. The soil in which peach trees have been grown seems to have a remarkable deleterious effect upon the other trees, both of peaches and apples, which we are inclined to attribute mainly to the excretory matters left in the soil by them. Yet there are certain plants and trees well known to be excellent and mutually fertilizing neighbors—a knowledge indeed as old as the days of Rome under her emperors, for at these early periods the Italian farmers commonly planted the elm as the companion or "husband," as they called it, of the vine, and there are other facts of a similar nature that go to corroborate this doctrines.

But more particularly upon the subject of farm crops, we will remark in conclusion that, in order to render the system of alternate husbandry more perfect, it is important to embrace the rearing and feeding of farm stock. Cattle convert the bulky products of the farm into meat, butter, cheese, &c. These concentrated products are carried to market at comparatively trifling expense. Cattle also furnish labor, and manufacture into manure the straw, stalks and other litter of the farm, necessary to keep up its fertility; for our farmers must learn that, without manure, the soil will grow poor, and its products actually diminish. Manures are the main source of fertility to our soils, and the substantial food of our crops. Our supply of these will depend on the amount of stock we feed upon the farm, and the amount of stock we can keep profitably, will again depend upon the fertility of the soil, and the consequent abundance of its products. So that grain and grass husbandry and cattle husbandry are reciprocally and highly beneficial to each other.

We regret that this subject is not better understood and more generally appreciated than it is in the West. If this system is thoroughly carried out, it will yield more *immediate* profits to the farmer, besides adding to the perpetual fertility and value of the soil, as an inheritance to his children.

From the New England Farmer.

Manures—Vegetable and Animal.

Everything which has growth upon the soil, even to the comparatively dry and unsucculent haulm or straw which most crops leave behind them, is capable of being transformed, by the chemistry of nature, into manure, or the pabulum of vegetable life.

By the term *humus*, we understand that portion of the vegetable structure, or organization, which is resolved, by fermentation, into mould; such as the foliage, the stems, anc succulent parts of the stalks of plants, and even those portions of the more perfectly liquified or woody organism, which are broken up by the play of chemical affinities, and made capable, when rendered soluble by water, of contributing to the development and sustenance of plants. It is rarely the case, however, that *mere* vegetable matters are applied to the soil artistically. They are, for the most part, used in conjunction with animalized particles, which render them more energetic, efficient, and salutary in their effects.

Even the manure from the stable is by no means a purely vegetable substance, although formed of hay and grain. In every case, portions of matter rejected from the animal system, are mixed up with the vegetable mass—worn out, abraded particles, which are no longer of any service, and which are thrown into the common receptacle which receives the residuum of the food that has not been digested, and from which it passes in the form of excrement.

The poorer an animal is, the less of this animalized matter does it throw off; hence the well known fact that the manure made by cows, oxen, horses, sheep and hogs, which have been well kept, is much more energetic and valuable than that furnished by those which have not been supplied liberally with food. The urine of every animal contains a certain portion of this animalized matter, and hence its superior value for agricultural purposes, and the high degree of vegetable fecundity resulting from its application to most crops and soils. The ammonia contained in this liquid manure also contributes, very essentially to its fertilizing powers; but the animalized matter is that which chiefly produces its fermentation and putrefaction, without which it would be nearly or quite useless for manurial purposes, at least in its immeate effects. Other principles highly beneficial to vegetation are also contained in urine, many of which are derived immediately from the food upon which the animal is kept. This remark applies also to the solid voidings, and is illustrated by the following table, showing the constituents of fæces and urine.

In one hundred parts of horse dung, in a fresh state,—the animal having been kept on oats, hay and straw,—there were

3.7 of biliary matter and coloring matter in a state of alteration.
6.3 of mucus, (crude,) &c., &c.
20.2 of non-digested vegetable remains and ashes.
69.8 of water.

100.0

The quantity of ashes in this case was six per cent. Their constitution, according to accurate analysis, was as follows: In one hundred parts—

Phosphate of lime,	.05
Carbonate of lime,	18.70
Phosphate of magnesia,	36.25
Silicia acid,	45.00

Urine from the horse contained, in one hundred parts—

Carbonate of lime,	1.1
Carbonate of soda,	0.9
Hippurate of soda,	2.4
Hydrochlorate of potass,	0.9
Urea,	0.7
Water,	94.0
	100.0

It will be seen that both these articles conrain carbonate of lime, a substance valuable to vegetation in many ways, and they are also replete with other highly energetic and valuable principles. In applying manure to the soil—whether animal or vegetable—we should endeavor, in the first place, to ascertain the character and condition of the latter, and also the habits, character and requirements of the crops intended to be grown upon it.—Whether we turn in green crops, or feed them to animals, and apply only their excrements, this information is alike essential to success. By applying to a vegetable, manure which does not contain principles congenial to its nature, or which does not enter into its constitution, we do

not secure those advantages which we might derive if the manure were more appropriate to the plant which it is desired to produce. It is worthy of some study, therefore, to act understandingly upon this point, and to furnish such aliment as will be taken and assimilated by the system, for the support of which it is intended. By enabling ourselves to do this, we shall obviate no inconsiderable expense and trouble, and ensure a better success.

From the New England Farmer.

Hog-Yard Compost.

In the immediate vicinity of your hog-pen, have a yard, strongly and permanently enclosed, and of sufficient size to afford ample accommodation to the number of swine you intend to keep. Into this cast as much good muck, chip-manure, sods, forest scrapings, loam from the road-side saw-dust, refuse hay, straw, haulm, and weeds that have not gone to seed, as will, when firmly compressed, form a stratum of one foot in depth over the whole yard. On to this let whatever liquids can be spared about the premises be directed, such as suds from the wash room, the wash from the sinks, a portion of rain water from the eaves, and whatever else that can be obtained that possesses any virtue. These fluids all contain more or less fertilizing matters, and if mixed with the other materials, will induce a thorough fermentation of the whole mass, and secure its preparation for the use and sustenance of crops.

A few quarts of corn, peas, buckwheat, or other grain, scattered over and dug into the manure, or dropped into holes made with an iron bar, will operate as an inducement to the swine to root and turn the mass, and thus effect the thorough incorporation of all the parts, so that, by their assistance, and the effects of a proper degree of fermentation, you will have, in the end, instead of the crude collection originally deposited, a perfectly homogeneous article of great richness, and at a moderate expense.

We mention the labor of the swine in this connection because it is a popular belief that they can be thus profitably employed; it certainly admits of a question, however, whether that belief is not fallacious. That is, whether the labors of swine in rooting up, turning over and mingling the common manure heaps of the barn, cannot be more cheaply performed by men, at common wages. In order to raise pork profitably, we must avail ourselves of two things, viz: get a *great weight*, and at an *early age*. Can this be accomplished by *working hogs*, for well-fed ones will not work much.

Is it not, then, better to feed swine, from the beginning, with as much nutritious food as they will eat up clean, and with a good appetite, when they will remain quiet and lay on fat and flesh with great rapidity?

If the manure made from the process described above is intended for light arenaceous soils, in which there is a want of cohesibility, it would be well to add a liberal porcentage of fine clay to the other ingredients, wherever that article can be easily obtained. This is the constitutional alterant which such lands require, and, with the organized and decomposable constituents of the mass, will produce most immediate and favorable effects.

By applying this earth in the compost, it will be found, that, although the quantity annually used, may be small, it will, in time, produce an important change, and secure a good degree of retentiveness and productive energy to lands ordinarily too light for the profitable cultivation of any crops but rye or corn.

There can be no doubt, we think, that the running of well-fed hogs on manure heaps is of great value to them; such hogs will not root much, while their constant droppings, especially the liquid portions, are of the most valuable character. Where they run over horse-manure heaps, they keep it compact, preventing the admission of air, and that rapid heating which quite often nearly destroys it. At any rate, in one or the other of these ways, or by partially using both, a large and valuable heap of manure may be annually secured from the hog-yard. Now is the time to begin the process.

The Sex of Eggs.

According to Monsieur Genin, a French savant, the sex of eggs can be distinguished. All eggs containing the germ of males have wrinkles on their smaller end, while female eggs are equally smooth at both extremities.

THE SOUTHERN PLANTER.

RICHMOND, VIRGINIA.

Salutatory.

Mr. Ruffin's card, in our last number, informed our readers of the disposal of his interest in the paper to the subscriber, who with much diffidence, enters upon the duties to which he has succeeded as Editor. In assuming the labors of this position, we are actuated by a desire (not only "of increasing our yearly stipend,") but to improve ourselves in all matters pertaining to scientific and skilful agriculture. We hope to derive much profit from the experience of the intelligent contributors to the paper, as well as to lay before our readers the results of the best practice derived from such sources, and also the instruction to be drawn from the best standard works. We shall strive to make the "Planter" a welcome guest in the home of every farmer, and a well meaning, if not always judicious counsellor in agricultural matters. That we may do this, we invite communications from all farmers on any subjects of interest to the profession.

We do not expect to *replace* Mr. Ruffin; but, as Mr. Jefferson said of Dr. Franklin, we "only succeed him." He is known not only to the immediate circle of his personal friends, but to all the readers of the Planter as a graceful, fluent and forcible writer. He will be always cordially welcomed to a place in its columns.

We should do violence to our own feelings did we not *here* express our grateful sense of his generous and courteous introduction of ourselves to the friends and subscribers of the paper, and assure him, and them, that it will be our constant endeavor to become more and more worthy of their confidence and esteem.

We have ever loved agriculture, and been strong in our faith of the truth announced by the wisest and most prosperous of the sons of Earth, "he that tilleth his land, shall not lack bread." Nor has our affection been at all weakened, or diminished by being for a time engaged in other pursuits. We have turned to it as a "first love"—hoping to find in the pleasure of its pursuit, that freedom from anxiety and dependence which is denied to those of many other avocations.

We recognize agriculture as the profession first ordained of God, and the distinction of being a scientific and successful farmer, as an honor not unworthy of the highest ambition of any son of "Mother Earth."

We undertake our editorial labors, trusting that they may not be unprofitable to our subscribers, or ourselves; but that as we journey through life, we may be co-workers in promoting the welfare, and strengthening the ties of fraternity among all those who share in the pleasures and toils of the farmer.

J. E. WILLIAMS.

Labor---A Duty.

Since the divine announcement to our first parent, "in the sweat of thy face, shalt thou eat bread," there has existed a dire necessity for his descendants to labor—for upon the fruits of the earth, (which she will only yield to the industrious) are we dependent for existence. The idle, and slothful, can prolong their useless existence, *only by subsisting on the charity of others*, who are energetic and intelligent. Wisdom, and strength, are the companions of mental and physical effort. With exercise they grow—without it they are depressed or destroyed. We must labor if we would have vigorous and healthy bodies; we must *think* if we would acquire, or retain, any greater degree of intelligence than the mere instincts of animal life.

"A soul without reflection, like a pile without inhabitant, to ruin runs."

We should put into active exercise, for useful purposes, every faculty of mind and body, with which a beneficent Creator has endowed us for the promotion of our own and our neighbor's welfare and happiness. This is a duty we owe alike to our Creator, society and ourselves.

Society is a chain of many links, all of which should be well connected, since each is is dependent upon the other for support, strength, and usefulness: and every man, in

order to fulfil the high purpose of his creation, and to prove his likeness to the divine image, should be ever ready for the kindly interchange of good offices, and generous sympathies. "There is work for every man to do." If, in the providence of God, some of us possess so great a share of this world's goods as to *cancel the necessity* of laboring for ourselves, *then do we owe it to humanity to labor for others.* There is open a large field of usefulness, in which our souls may revel in the delights of benevolence. Let us not pause in the "path of duty;" disheartened by the arduous nature of the task which may fall to our lot: but let us struggle on with a stout and cheerful heart against the ills of life—so, we may overcome them, and the more vividly enjoy its blessings. This is the way, the only way, which must lead to honor and the peaceful enjoyment of a tranquil conscience, for *only he*, "who does the best his circumstance allows, does well, acts nobly." Let no weak brain suggest, that in occupation there *can* be aught degrading. The man should confer honor upon his position, and not claim respectability *from it alone.* Let him, in whatever station he may occupy, "act well *his* part," and not stand content an idler amid the progress of the rest of creation—a "drone" in the world's hive. Virtue, education, and industry, fit us for the highest class of society: nor should there be jealousies and heart-burnings between those of different positions. Rather let us be harmonious, and fraternal members of one family—each laboring for the highest good of each, and every one, for all. *Then* we shall not live in vain, for only that life has failed in its object, and proved worthless, which has been spent in selfishness, and sloth.

Green Rye for Soiling Cattle.

It is a common practice among the German residents around this city, to sow rye early in August if winter grazing is intended, or in September on good, rich ground, for the purpose of curing into hay, and for feeding green to stock. The rye is sowed thick, and as soon as the heads are formed, it is cut down and cured. This is usually about the first of May: and by the middle of September, another crop almost as good as the first can be secured. It is an admirable article for feeding when cut green for all kinds of stock, in the early spring—as at that time, almost all animals stand much in need of succulent food. They are feverish from the irritation produced in their systems by the process of "shedding off" their old coats. Green food at such a time, exerts a cooling, as well as aperient effect upon them. Horses are very fond of it, and it is good "medicine" for them as they almost invariably have "Lampass" at this season of the year—produced by having been confined to dry food for several months, the effect of which is to constipate the bowels, and produce disorder of the stomach.

We have, for several years past, had a small lot of rye for soiling; and would recommend to all of our subscribers who have not already done so, to try it. We know of but one objection to it, which is, that it is very hard to kill, and without much care to prevent it, is apt to be scattered about the different fields, and thus creep into the wheat. Give to the stock, along with the green food, salt, and air slaked limed, occasionally—

Messrs. Editors:—In the number for May 27, I see an inquiry about green rye for soiling, I have been raising rye for soiling for the past ten years. I commence cutting about the last of April or first of May, as as soon about as the heads begin to appear. For the first few days I mix hay and green rye in equal parts running all through the cutting-box, for my horses and working oxen, and adding meal according to the work required. For my cows, I think the rye and hay as good as hay and bran. As the rye gets larger and harder, I discontinue the hay and feed rye alone, just as it is cut from the fields to my cows, but continue the cutting for the teams until the orchard grass is large enough for them.

I sow early on rich land, for the first feeding; sow later and very thick, and, if necessary to keep it back, pasture it in the spring, for my last feeding. I think rye the most profitable crop for a short time in the spring, of any greep crop I raise. I have soiled from twenty to thirty head of cows all summer, for the past fifteen years.

Can you or any of your subscribers tell me if winter barley is grown in New York, or as far north as New York? If so, where can it be had, and at what price? LEWIS BAILEY. *Moray Farm, Fairfax Co., Va.*

Answer to the Enquiry of "G. G. M."

A correspondent in our June number, over the above signature, appeals to the practical experience of ourselves, or of our readers, for

an answer to the enquiry, "Whether cutting dogwood in July, or August, will kill it root and branch?" He will find that the dogwood trees mentioned, which he has left standing in his proposed clearing, (for the convenience of grubbing,) may be summarily disposed of without resort to the process of killing them.

Dr. Robert H. Nelson, a judicious, practical farmer in Hanover, pursues (if we have not misapprehended him) the following method of extirpating them. On one side of the tree the large roots are carefully traced, uncovered, and, at a suitable distance from the trunk, severed. An ox-cart (without the body) is then employed as the simple machinery by which they are removed. On the side opposite to that on which the roots are cut, the axle of the cart is made fast to the body of the tree. A chain is then fastened as high up on the tree as can be conveniently done, and the other end is securely attached to the tongue of the cart, so that, in addition to the force exerted by the draught of the team, the tree itself is made to supply the leverage for its own extraction. When the trees are not so large as to require the use of oxen, their removal may be effected by a slight modification of Dr. Nelson's method. Back the cart up to the tree and place the tongue perpendicularly against the trunk. In that position both the axle and the tongue of the cart are made fast to the body of the tree, and then by a strong rope, or chain, attached to the end of the tongue, it is pulled downwards by hand until the laborers are able to throw their own weight upon it. The chain which fastens the body of the tree to the axle of the cart, should be so disposed, (say 10 or 12 inches below the axle,) that when the tongue is drawn downwards the tree shall be prized upwards. It will surprise any one, who has not seen the operation, to find what an amount of mechanical power is exerted, and how effectually the work is done.

Pear Manual.

We are indebted to the courtesy of the publisher, Mr. A. O. Moore, for a copy of T. W. Field's manual of instruction on the propagation, planting, cultivation, and management of the pear tree. We confess to a full share of ignorance on this interesting subject, but we shall gladly avail ourselves of the opportunity for instruction which may be gained by a careful perusal and study of the book. The plan of the work seems to be comprehensive, and the treatment of the subject thorough.

We clip from the New York Observer the following notice of the work.

PEAR CULTURE.—A manual for the Propagation, Planting, Cultivation, and Management of the Pear Tree, &c., &c., by Thomas W. Field. A. O. Moore, 140 Fulton street, New York.

In this charming little manual, Mr. Field has performed an excellent service for those engaged in the pear cultivation without experience. He has given his attention to the subject for years, and has reaped his reward in the production of some of the best specimens of both fruit and trees that we have ever seen. The results of his experience are detailed in this volume, in terms so simple, concise, and perspicuous, that all may read and be profited. The book is well furnished with illustrations of fruit and modes of propagation, culture, &c.

Rust on Oats.

From the following article, taken from the *Southern Homestead*, it will be seen that the rust on the oat crop has appeared to an injurious extent in Tennessee.

The microscopic investigations of the Editor do not correspond with those of our correspondent, "NOTTOWAY," on the rust on wheat, as it respects the cause of the phenomenon; but may not the black bug, which he describes, be identical with the aphis, or cotton-louse, which has been the occasion of such destruction to the oat, as stated by "NOTTOWAY"?

RUST IN OATS—WHAT IS IT?

Throughout the whole South-western portion of the Union the oat crop has suffered from a terrible blight, which, from its resemblance to the fungous substance that sometimes attacks wheat by that name, has been called *rust*. So far as we are informed, rust in oats has hitherto been unknown. We have never heard or read of anything of the kind, in any section of the country. The fact that it is thus unusual, opens a wide and interesting field to the naturalist, and in this case, to the entomologist, as it invites investigation in a channel, so far as we can ascertain, heretofore unexplored.

While in West Tennessee, a short time since, we took occasion to examine the blade of the oat under a microscope, (kindly furnished us by the Baily Troup,) and were greatly surprised with the phenomenon which the glass revealed. Since then, we have followed up those examinations, by the aid of more powerful instruments, at the Medical College in this

city, in company with several scientific gentlemen, among whom were Drs. Briggs and Buchanan, of the Medical Faculty.

The cause of all this destruction of the oat crop is a living worm, too small to be plainly seen with the naked eye. A single blade or leaf of the oat sometimes contains hundreds of them. They lie encased in the tissues of the leaf or blade where they have been germinated, beneath the epidermis or thin pellicle over the exterior portion of the blade, and as they progress in development, the skin of the leaf is raised into curious puffy blisters. The growth of the worm subsequently ruptures these, and it escapes to feed on the plant. When first released from their covering, they are of a beautiful red color, almost transparent, but soon begin to change color and form, getting more opaque and dark in appearance until, in the course of transformation, they become a black bug, with legs and wings, when they attack the head or grain of the oats.

Under the microscope, the dust which remains on the leaf, closely resembles that on the wings of butterflies.

How this innumerable army of infinitismal worms originated is yet a mystery. It is a singular fact, however, that wherever the greatest quantity of rain has fallen, there the oat crop has fared the worst. In our recent trip through West Tennessee, we saw but a single field of oats, between the Mississippi and Tennessee rivers, which was not a total failure, or into which it would be folly to put a scythe-blade. That field was near Denmark, in Madison county, and was sown very early. It is well known, that more rain has fallen in West Tennessee, this season, than in any other part of the State: hence the extreme wet weather must have had some agency in the production of this animalcule. It is also well known that moisture and heat will produce and multiply animal life, millions per hour, and therein we judge is the secret of this destruction of the oat crop. It is one of those cases of natural phenomena which occur only at a certain stage in the growth of plants, and under peculiar states of temperature and weather. It may happen next season, or it may not occur again for many years.

Manipulated Guano.

Whoever may be entitled to the honor of having originated the manipulation and commixture of ammoniacal and phosphatic guano, (a question on which we do not design to express an opinion,) we are satisfied from experiments with mixtures of our own compounding, and from the testimony of others who have tried the "manipulated," that the combination of different guanos in proportions adapted to the wants of the soil, constitutes a valuable and economical fertilizer, and that its efficacy is promoted by its thorough pulverization, and commixture.

The purchaser will, of course, be influenced by the guaranty offered by the seller, in his personal character and pecuniary responsibility, as well as by the testimonials offered to sustain the claim of his particular preparation to his confidence. He will also judge for himself whether it is more economical and advantageous to avail himself of the skill and machinery of others, who prepare the compound, or whether he will purchase the ingredients separately and combine them in proportions to suit his own wants, reducing and mixing them by the aid of such rude machinery as he may chance to possess, or his own inventive genius may enable him to produce.

In calling the attention of our readers to the advertisements of Mr. Kettlewell, and Messrs. Reese & Co., which appear in our advertising columns, we ask, (what we presume is all they desire), a candid consideration of their claims to the confidence and patronage of the public.

To Subscribers.

In consequence of the change in the Proprietorship of the "Southern Planter," it is very important that our subscribers should remit the amount of their indebtedness with as little delay as possible.

The amount due from each subscriber is in itself comparatively trifling, but in the aggregate it makes up a very large sum, and if each subscriber will consider this as a direct appeal to *himself*, and promptly remit the amount of his bill, it will be of infinite service to us.

We commence sending with this number the bill to each subscriber who is in arrear, and shall continue to do so until all shall have been sent out. We ask, as a favor, a prompt response from all.

The bills are made up to 1st January next. The fractional part of a dollar can be remitted in postage stamps, or the change returned in the same.

August & Williams.

July 1st, 1858.

To Postmasters and Others.

We are satisfied, that with proper exertion, any person who will interest himself for us,

will be able to make up a list of *new* subscribers for the "Planter," in almost any neighborhood, in this or any other of the Southern States. We offer, as an inducement to those who are disposed to aid and encourage us in our efforts to extend the circulation of this paper, the following premiums in addition to our hitherto published terms:

To any person who will send us clubs of

3 *new* subscribers and $6,—
The So. Planter for 1857.

6 *new* subscribers and $12,—
The So. Planter for 1857 and '58.

9 *new* subscribers and $18,—
The So. Planter for 1857, '58 and 59.

15 *new* subscribers and $30,—
The So. Planter for 1857, '58 and 59, and a copy of the Southern Literary Messenger for one year.

To single new subscribers we will send *the present* volume, (commencing with the number for January, 1858,) at the low price of $1 50, *paid in advance.*

We call upon every one interested in promoting the progress and improvement of agriculture, to lend us his aid in contributions of original articles on practical or scientific agriculture, in order that our paper may continue to be worthy of the confidence and support of those who have hitherto so liberally sustained it, and to whose interests its pages will continue to be zealously devoted.

AUGUST & WILLIAMS.

July 1st, 1858.

Wheat Market.

The following timely and judicious "caution to farmers," is taken from the columns of the SOUTH, under date of the 12th of July. Since the appearance of that article, the Richmond market has been opened by the sale of a limited quantity of new wheat. The first samples, we learn, brought $1 25 for prime white, from which it soon rose to $1 40; and since the last accounts from England, received here on the 20th July, it rose to $1 45 for the best. Red wheat, we learn, is 10 c. per bushel lower than white, as per quality.

THE WHEAT CROP—A CAUTION TO FARMERS.

Every year, at this particular season, the hearts of the million are gladdened by the promise of a redundant harvest. From all regions of the earth rumours reach us of a prodigal supply of the stuff which men manufacture into the staff of life. The inevitable recurrence of this delightful prospect and its frequent blight before maturity, have suggested the suspicion of a conspiracy among speculators. The corn trade of the world is in the hands of a very few men, in comparison with the great mass of producers. They are animated by a single impulse; they are bound together by a perfect unity of interest; they have great intelligence, and an unlimited command of capital and credit. On the other hand, the class of producers are dispersed over the face of the earth, without communication or concert, with but little information of the market, and destitute of the resources necessary to resist a combination against their interests. If the factor is unable to impose upon their credulity with his extravagant stories of an excessive harvest, in their necessities he will find the means of securing their crop at an inadequate price.

Never was the promise of an abundant supply of wheat more satisfactory than at the present moment,—if he choose to accept the assurances of speculators. If we turn to the commercial column of the leading papers in any city, we will find the most flattering reports of the crops. The authority of competent writers is invoked to persuade the farmer of an inevitable decline when the harvest is realized. And care is taken that the market shall open at a moderate price. The producers have no alternative but to acquiesce in the arrangements of the speculators.

Among our readers there may be a few farmers who are not obliged to dispose of their crop immediately. To such, we would address an earnest remonstrance against a precipitate sale.

At this office papers are received from every part of the country, and we have searched them diligently for information in regard to the probable yield of the present harvest. All accounts agree in representing it far below the usual supply. From no quarter do we get authentic reports of even the average crop. In this State, certainly, the harvest does not begin to realize the promise of the early spring. We believe it is an exaggeration to assert that the present wheat crop of Virginia, approaches within *eighty per cent.* of the usual production. And as far as we can gather from the local papers, an equal deficiency may be affirmed of every other wheat growing State.

But the speculators pretend to anticipate a redundant crop in Europe. From a vicinity in which their exaggerations are discredited by accurate accounts, they take refuge in a distant and unexplored region. Now, the latest advices from abroad, though ever so encouraging, (which they are not,) would justify no approximate estimate even of the harvest in Europe.

Everybody knows that to the last moment wheat is liable to the most destructive visitations; and nothing is so idle, therefore, as to undertake to compute the yield of an unheaded crop. Some time must yet elapse before we can get any reliable returns of the harvest in Europe.

Meanwhile we entreat our farming friends not to precipitate their crop upon the market. Above all things reject the proposals of those itinerant agents who beguile you with fabulous statements of a superabundant harvest.

For the Southern Planter.

To the Proprietors of the Southern Planter:

GENTLEMEN:—In the June number of the "Southern Planter" there is an editorial, in which a very brief and rapid sketch is given of "Manipulated Guano," but exceedingly meagre in comparison with the extent to which it has been used in Maryland; and the results there are stated as not applying to, or affording a foundation to express an opinion of what its value would be upon Virginia lands.

I have not the paper before me, but according to my recollection, I have given the substance of the article upon that point.

Fortunately, my "Manipulated Guano" has been so extensively used in your State, as to make its own record, without being dependent upon a sister State for information so important; and those who feel an interest upon the subject, can find in my certificates and references good Virginia names, in various directions, who would, no doubt, if applied to, take great pleasure in answering every inquiry upon a subject of such universal interest to the agricultural public. Indeed, for many reasons, I should feel under obligations to all who would *wade* through my "controversy and advertisement," published in the present number of the "Southern Planter."

In consequence of a sentence in the same editorial to which I alluded, I feel it necessary to state, that *I always have, and now do warrant*, and by this covenant make such warrantee of legal and binding effect upon me, that my No. 1 "Manipulated Guano" will always contain 8 per cent. of ammonia and 45 to 50 per cent. of phosphate of lime; and my No. 2, 5 per cent of ammonia and 50 to 55 per cent. of phosphate of lime; and shall authorise my agents, Messrs. Deane & Hobson, of Richmond, and all others, to confirm this warrantee.

Very respectfully, your ob't serv't,
JOHN KETTLEWELL.

For the Southern Planter.

I don't remember when or where, though I think in the "Planter," I have read an account of the curing of tobacco with coal, and that it answered well.

The place on which I live is rather scarce of wood, too much so certainly to cultivate tobacco extensively, unless I can find a substitute in the use of coal for wood. Can you, or any of your correspondents, say in the "Planter," the kind of coal used, how much of it, (to a house 22 by 24, with 6 firing tiers,) and whether it really answers well in all particulars, &c., &c.?

We will endeavor to furnish our correspondent with full information on the subject of curing tobacco with charcoal, in the September number.—[EDITOR.

For the Southern Planter.

Character and Habits of Birds.

MR. EDITOR:

As a dear lover of birds, whether stuffed, confined in cages, or at liberty in the open air, I have read with the greatest pleasure the "Ornithological Sketches," which have appeared in the late numbers of the Planter. And, if you consider them worthy of a place in your periodical, I will give you a few observations I have made, on the characters and habits of the birds mentioned in those "Sketches." Some years ago I put up a little box for birds, and, in a few days, found that it was occupied by a pair of house-wrens. The female laid a good many eggs, sat upon them, and finally hatched some nine or ten young ones; but I found, to my surprise, that instead of attempting to raise all she threw at least half of them out of the box, which being killed by the fall, there remained only four or five in the box. This is the way I account for their not raising so many young ones as they lay eggs.

Instead of the overplus of eggs laid by the wren being useful, as "F." supposes, they are the means of bringing into existence these little creatures only to be destroyed by their *producers*.

This is a habit that does not argue at all in favor of the *devotedness* of the wren to her young, and is calculated to put her below a state of equality with other birds.

However, other birds may be guilty of the same, and, if I were called upon to accuse any, I should accuse the purple martin, (although my favorite.)

My reason is this: I was once noticing the volitations of some martins, when I observed that one of them had something white in his mouth, apparently very large for so small a bird to carry. I was very anxious to find out what it was, when, luckily for me, it fell, struck the top of a stable near me, and then rolled off on the ground within a few feet of where I was standing. I ran to see what it was, and found it to be a *young martin*, only a few days old. Whether it was done intentionally, or not; or whether it was the offspring of the bird that let it fall, or not, of course I could not ascertain.

The martin may have been carrying his

young to another box, and let it fall accidentally; or he may have been destroying them as I have just shown the wren does, or he may have made a depredation on some other nest, as I think is sometimes the case. I have seen them pull each other's nests in pieces. But whatever may be said of him, he is the most impartial bird I know towards his young. He divides the food among them as equally as a father could divide an apple among four sons.

But I have digressed, and will return to the wren. The wren (of which I speak) will build almost any where he can hide himself. I once knew one to build in the folds of an old blanket that was thrown across a fence, and seemed as well contented as if he was lord of one of those beautiful little bird-palaces so common in Greenmount Cemetery, near Baltimore.

Some years ago, when I was at boarding-school in the country, an old negro, named Edmund, was going to kill a *beef;* of course all the boys were anxious to see the operation performed. So we all went to the *old log house* in which Monsieur Boeuf was to experience the density of the steel in old Edmund's axe, of which he boasted so much. After having got everything ready, Edmund pulled off his coat, threw it across one of the joists which extended from one side of the house to the other, and struck the fatal blow quite to the satisfaction of the youthful spectators. But Edmund, in the excitement, left the scene and forgot to carry his coat with him. It remained on the joist for two or three days, when, as I was taking a walk one evening, I noticed that one of the sleeves was filled with something, which proved to be a wren's nest. Imagine to yourself what must have been old Edmund's surprise, when he pushed his arm into a wren's nest instead of his coat-sleeve.

"A stupid moment motionless he stood."

So much for the wren. Now for the blue-bird. Early last Spring I put up a box within two feet of my room-window; but, on account of its proximity to the window, none of the birds seemed to fancy its location, until I left the room and remained away on a visit of two weeks. When I returned a pair of blue-birds had nearly completed their nest in it.

As I am very fond of stuffing birds, and always like for them to look as *natural as life*, I seized this as a fair opportunity to test the matter. Zeuxis once painted grapes so natural that the birds came and pecked at them. I thought that if I could only see the occupier of the box attack my stuffed bird for a live one, I would be satisfied, without trying to gain what Parrhasius did, who painted a curtain so natural that Zeuxis, himself, ordered the curtain to be removed that he might see the painting behind it.

For the sake of distinction, I will give the blue-birds each a name; and as I am as fond of *Irish names* as "F." is of preachers, I will call the *occupier of the box* Jimmy O'Brien, and the *stuffed one* Pat. O'Flanagan. On a very pretty morning last week I placed Pat. in a chair at the window, and hoisted it. In a few minutes Jimmy was seen to light upon the window-sill. So soon as he saw the *supposed* intruder, Pat., he flew at him violently, knocked him over in the chair, and then flew out of the window. There was a golden-winged woodpecker in the chair at the time, which I removed, and substituted a robin in his place. Jimmy soon returned, flew at Pat. as before, knocked him down, jumped upon him, and pecked him so furiously that I thought he would tear him in pieces. I scared Jimmy out, and found that he had injured Pat. a good deal. I found that Jimmy would attack neither the woodpecker nor Robin, when put in the chair together.

Not wishing Pat. to be injured any more, I then put him in a cage and placed him at the window. Jimmy returned, flew against the wires of the cage, and struck such severe blows that he entirely displaced one of the feathers in his wing. Since that time I have often seen him trying to fly through one of the panes of glass in the window. On one occasion he flew against it eighty-six times. What is his object in so doing I cannot imagine, unless he wishes to find Pat. O'Flanagan, who is as little aware of Jimmy's intention, as if he were in "Ould Erin." 'Tis often thus with *men*. They look upon those as enemies, and even pursue those who can do them no harm in the world; but do not find out their mistake until they have made themselves *ridiculous*. I have not disturbed Jimmy lately, not wishing to make him leave the box. Lady O'Brien is now sitting, or, at least, trying to sit; but, on account of the frequent passing about in my room, she is very fearful, seeming to be always starting. She puts me in mind of the hen the Irishman could not get to sit, until he at last put her on the nest with a half-bushel measure over her, and then declared that, when he took the half-bushel measure off, "she was setting, standing up."

As for the Baltimore oriole, (Ictuus Baltimore), the most remarkable thing about him, is the ingenuity he displays in building his nest. I have never been able to find two alike. They differ in shape, size, and the materials of which they are built. The prettiest one I ever saw was cut, two or three years ago, from the extremity of an oak limb; it was composed, principally, of calico and muslin scraps, hair and grass; but the most novel feature was, that it contained two large *needles*, with threads in them of considerable length, which were so interlaced between the other materials of the nest, that they could not possibly be reclaimed without pulling the nest in pieces. From the condition of the threads, and the directions of the needles, I was satis-

factorily convinced that the bird used them in building his nest; for one of them passed through a small perforation in a leaf, made, I suppose, by a worm or bug. Every one who knows anything about the oriole, knows that he first fastens one end of his thread, or grass, and then works the other into the nest to suit himself. This is one of the strongest proofs that could be adduced, in favor of the inference, that the bird *actually sewed* with the needle. For had he fastened the needle to a branch or leaf, and gone to work with the longer end of the thread, in pulling it about he would certainly have unthreaded the needle; besides, the longer end of the thread was so tangled and knotty, that it could not possibly have been put through the perforation I have mentioned. However, let us go still farther, and suppose that the thread was at first straight, and that he caught hold of the longer end of it instead of the needle, then the weight of the needle would have pulled the thread out as fast as the bird pulled it through, unless the female assisted him, which is an improbability. The bird certainly knew that the needles were sharp, for the points of both were outwards, and projected from the outer surface of the nest about one half their respective lengths. I suspect that some persons will be as much surprised at what I have stated, as if they had been told that the Leviathan *was lost in a storm in a wash-tub;* however, what I have said is rigidly true, besides,

"Je ne sais point l'art de faire des miracles."

I would say, with due deference to such persons, that if Ornithology was not included in their *course of study* when at *college*, that by a careful study of Wilson, information will be gained which will prevent them from making so great a mistake as the lady, who, when asked by her beau the name of a certain star, replied, "I don't know the name of it, I never studied botany." H.

Plain View, King & Queen co., Virginia, June 25th, 1858.

For the Southern Planter.

The Connection between Moral and Agricultural Improvement, and their Reciprocal Operation and Effects.

Man in his moral, social, and professional relations is by the adjustment of the Divine Author of his being, bound to his fellow man by an unvarying law of mutual dependence. Not that in the many and diversified avocations of life, private interests, or pursuits of individuals and classes are not maintained in all their distinctive peculiarities, but that besides these there exists *a community of interest*, a unity of distinct parts composed of many members in one body, which by natural and inevitable operation, makes the progress and improvement of any one class, the occasion of relative or proportional advancement in every other, or on the contrary, if from adverse circumstances, one member of the body suffers detriment or retrogression, then all the members constrained by the law of sympathy enter into the fellowship of its suffering.

These interchangable influences, which are in ceaseless exercise through the mutual dependence, to which we have adverted, give a universal interest to the consideration of our subject:

The Connection between Moral and Agricultural Improvement, and their Reciprocal Operation and Effects.

There is a law which governs the whole creation, by which every organic being is by the influence of habit, modes of life and changing circumstances, transmuted, sometimes so greatly as to retain scarcely any trace of its original.

In the vegetable world, the little wild rose has been changing under the constant culture and care of the florist, from generation to generation, till it has become the queen of flowers; in proportions, colors, fragrance, variety, surpassing them all.

The bitter, wild crab has been improved into the innumerable varieties of blushing and golden apples that bend our orchard boughs.

In the animal creation, the wild dog, always the same in color, form, and instinct, wherever found, has under the various influences of climate, habit, food and training, been transformed into many species, differing so widely in color, size, capacities, and form, that the original type is scarcely recognizable in them.

This law which we observe thus modifying the lower orders of creation, we in like manner observe affecting the physical organization of man, and through that, his mental and moral nature also.

The influence which his occupation and modes of life exert in modifying his character, both intellectual and moral, is not only acknowledged as a universal truth, but is a matter of daily experience.

No one ever looks for the development of the loftier and finer feelings of our nature, in the usurer or hangman, as he does in the devotee to science or the minister of religion. This principle is not only recognized in the common sentiment of mankind, but even gives a tone to the laws of enlightened nations, a proof of which is seen in an old statute which prohibited any butcher from acting as a juror in criminal cases. The occupation was believed to destroy the horror of bloodshed, and thus to render a man morally incapable of sitting in judgment upon a thing so sacred as human life. And though there may be men of vastly different type in the same vocation, there is still a general tendency in the duties and circumstances of every pursuit to raise or depress, to refine or imbrute the man, to warm and expand his heart, or to make it more cold and narrow.

The illustration of this principle afforded in the life of the agriculturist is perhaps more uniform and pleasing than in any other; for there seems to be a natural tendency in this pursuit to foster, if not to create many of the best feelings, principles, and habits, that dignify the individual or cheer the social life. And since it is by the culture of these that the moral nature is improved and exalted, it is an argument for that mode of life which by its natural duties, or necessary circumstances, brings them into continual exercise, and furnishes either a fairer opportunity for the cultivation of virtue, or a greater freedom from the common temptations to vice.

Among the many influences, which, working together in this calm and peaceful occupation, mould, and fashion the temper and character, it is not unfit first to notice the physical effect, for so curiously are we constituted that no influence can affect the body that does not also affect the mind and heart.

Who does not know what natural concomitants of disease, are selfishness and discontent? And who has not experienced that good health is a sort of soil in which it is comparatively easy to nourish the graces that sweeten and purify life.

It is upon this principle that the whims and waywardness of an invalid are excused. For it is through the physical organs that impressions are received. The torpor of a diseased body communicates itself to the spirit, blinds the eye of hope, palsies the heart of courage, and sets despair in the place of cheerfulness.

It cannot, therefore, be a matter of trifling importance to preserve their soundness and vigor.

It is not merely conjectural or inferential to say that agricultural pursuits are more promotive of health than any other. They are the almost universal refuge recommended to those whose physical powers are enfeebled by other employments.

Besides, statistical tables attest that as a class, agriculturists are the most long-lived, with one exception, and that exception is in favor of a class of people, who even more constantly and freely enjoy those influences of exercise, fresh air and sunshine, which doubtless are the main causes of the vigor and strength which they enjoy.

But this influence, though important, is secondary.

There are characteristic and peculiar influences, whose moral tendency is more direct and evident. First among these, is the immediate dependence for prosperity and success in his calling, upon a Power above and beyond his own, which cannot be so nearly realized by a man in any other pursuit of life.

The mechanic can, with his own hand, perfect the work he projects; but however vigilant and industrious the sower may be, he cannot change his little seeds into the forms of strength and beauty with which they presently reappear after he has hidden them in the earth.

And even after the Creating Hand has reproduced in living freshness, what was cast into the soil apparently shapeless and dead, how emphatically is he made to feel that his labors are in vain if those genial influences are withheld, which, from the falling of the grain into the earth, in its first springing, in its constant growth, and unto its full maturity, are the essentials of its existence.

And though every man is dependent for every measure of success in any calling, upon the same Paternal will and blessing, yet there is a direct and visible dependence in this pursuit which does not appertain to any other, and which actually does check and forbid the cold atheism of the native heart.

Besides this, there is in the daily, almost hourly communion with fresh nature, in all the beauty of her revolving seasons, not only delight for the senses, but admonitions for the heart, and though the effect of such influences may be imperceptible, it is not less certain.

There is also an adaptation in the scenes and occupations of rural life to inspire an homage of the heart for an Unseen God, while the presence of every form of beauty, fills the mind with that imagery which is the most appropriate language of Nature's worship. The melody of the ancient pastorals, both sacred and profane, are the witnesses of this. Their power and sweetness find an echo in all hearts, and attest their birth-place to have been far removed from the burning thoroughfares of the crowded world, where amid the strife of avarice and ambition, no such cooling fountains have place to flow.

But it is in the development of more ordinary and practical traits of character that the chief recommendations to this pursuit of life are found, virtues which, though no less excellent, are in daily demand in the prosecution of necessary business, or called into play by social arrangements.

Prominent among these is the habit of systematic industry, not only in itself one of the conditions of permanent wealth, health, and happiness, but also a safeguard from vice. Yet it is a virtue somewhat despised by multitudes who are impatient of this tardy method of improving their fortunes, and would rather deliriously risk all upon a change in the market, than slowly toil their way to independence; because if they thereby suddenly awake to fortune, they have no longer need to cultivate such a primitive habit, however excellent. They are not content to bow for their lessons of practical wisdom, to the little ant, who in the quiet and steady observance of the law of her being, lays by in season her ample store.

The necessity which urges the agriculturist to cheerful labor in its season is his blessing, while it is equally his blessing that the reward

of his toils must be patiently waited for until it can be possessed by the ordinary laws of gradual increase. There is induced by these habits, a moderation of purpose and desire that are to the heart and mind what health is to the body.

It may not seem irrelevant to this part of the subject, to ask where, in all the world, can be found, unless among the country homes of Virginia, any representatives of a class in whom the galaxy of domestic virtues shines with a lustre so rare as to entitle the possessor to the name of "virtuous woman?"

"Who seeking wool and flax, worketh willingly with her hands, who layeth her hands to the spindle, and her hands hold the distaff; who to her cheerful industry links the grace of liberality.

"Stretching out her hand to the poor, reaching forth her hands to the needy." And to that a provident care which causes her "to rise while it is yet night to give meat to her household and a portion to her maidens; and a prudence which rules her tongue with the law of kindness; so that strength and honor become her clothing. Her husband is known in the gates, sitting among the elders of the land. Her children also rise up and call her blessed."

This portrait is not a familiar one in our day, even in the farm-houses, but only there is it seen at all, and when seen is a living and refreshing commentary on the worth of those unobtrusive but real virtues which flourish best in such positions.

The absence of intense excitements from the business of agriculture, and the necessity to uniform, earnest, systematic industry, are of themselves healthful influences, but they also put a check upon the native avarice of the heart, by the slower and more gradual accumulation of wealth.

Riches may be garnered into barns and store-houses with as much idolatry as into banks and bags, but it is unusual to see such a result.

There is such a natural and universal delight in improving the resources as well as the appearance of the farms, that increasing wealth flows into channels which refresh, gladden, fertilize, instead of accumulating in coffers, or ministering to the feverish and ever-changing extravagances of pride.

If there is comparative freedom from evil influences of this sort, there is also a comparative freedom from the temptations to low vice, by the isolation of both the dwelling places and business places of this class of the community from the haunts of vice. It is in cities that its practices are improved into a science, from whose schools the most skilful are sent out to allure the unwary.

Their snares are spread for the feet in every pathway. The tempters are so thickly posted that they taint the air.

But the daily routine of duty does not bring the agricultural community into such close and unavoidable proximity. They escape even the knowledge of much of the vice that blackens the hearts and lives of men dwelling in masses.

As there is unquestionably in the business life of agriculturists a tendency to foster virtuous habits and principles, there is also in their social life a degree of sincerity, hospitality and brotherhood which is not seen and felt elsewhere. In illustration of this may be noted their habit of assuming one another's burdens, and helping forward one another's labours in seasons of pressure with as much energy and alacrity as they pursue their own business. In these cheerful exchanges there is but the development of a principle which must govern every social system, it is true, but here there is not the usual form of measure for measure.

The nurture of this feeling of brotherhood is never more delightful nor profitable than in the exercises of the law of hospitality, but it is in the hearts and homes of the agricultural population that its duties and delights are most freely practised and enjoyed; not among the rich and prosperous alone, but in the humblest homes of poverty this virtue abides.

With the sojourner and stranger they at all times participate the bounties so freely bestowed upon themselves, for it is one of their most natural and cherished pleasures.

Where men dwell in masses, the sweet and constant exchanges of courtesies and sympathies around the hearthstone, give way to costlier, more doubtful and less joyous pleasures, while the stranger often passes through the multitude as unknowing and unknown as if he came not.

But it is in the type of sincerity that the social life of the country is felt to be superior to any other. Instead of the forms which are adopted to disguise the want of a social heart, there is felt to be a warm and glowing interest and affection in their circles compared with which the splendid shows of city life are a mockery. That sort of hypocrisy, too, which in ordinary intercourse, countenances even lying words, is unknown, and the manners are simple and truthful. It lends a force to the argument that there is an influence for good in these pursuits, to observe the record of history concerning the human race. To dwell among enjoyments and engage in employments like these, was deemed the station most appropriate for sinless man. All the circumstances which favour the natural development of his loftiest powers, must be found combined in the lot which was chosen for him while holy by a Creator and Father who forms and disposes his creature for his own glory. And when his high estate of purity and joy was forfeited, the occupation which was to have been only a delight, was appointed as his labour.

We find, also, the first design of build-

ing a city and dwelling in masses, crushed by the Almighty hand in order to restrain men from all the evil they had "imagined to do." This fact bears indirectly but not doubtfully upon the subject. Following the records of history, from whose misty uncertainties some facts arise with all the abiding boldness of truth, we constantly find men of the most distinguished genius and virtue breathing their congenial air among the retirements and employments of agricultural life.

At one time a tender shepherd is called to exchange his humble crook for a royal sceptre, and the care of his docile flock for the government of a nation. The heroism which had matured in the solitudes where his defenceless charge were used to wander, comes into requisition when that nation's hosts are to be led to victory.

At another time, when a voice of wisdom and moderation is needed to calm the strife of opposing factions and to restore public order and confidence, the possessor is found unconscious at the plough. Nor was he once only, but twice withdrawn from this congenial pursuit, because the changeless integrity of his nature was the only stronghold of his country's dependence.

Instances like these assuredly favour the argument that there is something in these pursuits that promotes the growth of those great qualities both of heart and mind, an impersonation of which it is rare to see among the corrupted mass. Great souls are not only nurtured among them, but they also seek their repose from the fevered excitements of public service, in the less brilliant but not inglorious toils of agriculture.

To pass by all others, what Virginian does not at once revert to the career of him whose name stands above all other names in the history of mere human actors? A name revered and honoured not alone by his own countrymen, but to which distant nations pay continual homage, bringing, even at our day, tribute to his memory from the land of heroes and sages.

Amid the shades and toils of a country home were those talents and virtues ripened and perfected which give such a halo to the name of Washington; and after his great deeds were well done, and a grateful people would have continued to lavish honours upon him, he put them aside and sought repose and satisfaction in the same congenial scenes.

The foregoing remarks have borne upon the improving moral influence of agricultural pursuits and the habits of life incident to them, and if there be any truth or pertinence in them, every improvement in the science or practice of farming by which it is rendered more attractive or profitable to those already engaged in it, or by which a motive is furnished to others to engage in it, is a public benefit.

If there be a natural tendency in the habits, occupations and circumstances of a farmer's life to preserve and cherish the better feelings of the heart, it is an argument for the propriety and necessity of a spirit of earnestness in every effort to elevate this pursuit to its proper rank by all the aids which research or enlightened experiment can afford. Because every improvement in agriculture would be an advance in the real prosperity of the people, not only augmenting their financial resources, but increasing their moral elevation.

In tracing, on the other hand, the influence which is exerted over this pursuit by the moral tone either of the individual or the class, it is safe to affirm that in general there is a connection, not doubtful and uncertain, but unvarying and sure between good morals and successful business of whatever sort. All experience attests the truth of this assertion, and it always will attest the same, for it is only the fulfilment of an irreversible decree which links together national righteousness and national prosperity. Nor is it at all difficult to find an explanation for this, when we consider that from the same fountain from which emanated that code of laws which is the only standard of pure morality, also emanates every physical influence and energy; and that it would be impossible that the outward tokens of Divine favour could be continuously given to vicious principles and practices. This code of laws (our standard of morality) was given to a nation of agriculturists, at least to a nation about to become so, and though its minute details were given doubtless for the special direction of a particular people, their instructions are interesting and useful to all people; for they are but the elaboration and application to particular cases of the ten great statutes which are the foundation of the constitutional law of all enlightened nations.

Among these details we often find admonitions which are designed to keep in exercise habits of temperance, diligence, justice, mercy, truth, and love, and the accompanying assurance of abounding prosperity in the fulfilment of such conditions.

When these people at their harvest seasons reaped but ten measures where twenty were looked for, or from their presses drew out but twenty vessels where they looked for fifty, a message comes to assure them that their blasted hopes were the rewards of unrighteousness. In many of these injunctions, as, for instance, that of kind usage to the slave and the brute, the operation of the principle is natural and evident, because their permanent health and power to labour are dependent upon such treatment.

To show that the conditions of personal and national prosperity are still the same, a fact may be adduced which is of decided import on this subject. In one of our Southern States the principle has been fairly tested whether the temporal interest is promoted or hindered

by a disregard of the Sabbath law of rest. For a period, it was not uncommon there to deny the slave and brute this rest and refreshment. It was invariably found that the amount of labour performed by those to whom the Sabbath rest was denied was less, and also that their lives were shortened under such a system.

Here is an effect that can be weighed and measured, or whose value can be computed in dollars and cents.

If it were possible to make the same test in regard to any of the principles of a high and pure morality, it cannot be doubted that the result would be uniformly the same; for they are not arbitrarily imposed, but are given for the security of the highest and best interests of the human race.

In further illustration of this subject, it may be observed that the pursuit of agriculture in all countries, receives in common with all other lawful occupations, a forward impulse from the introduction and spread of Christianity, and that a reciprocal influence begins immediately to work, showing itself in the multiplication of schools and churches, which become fountains of mental and moral influence and elevation.

In the dissemination of these principles, are sown those seeds of righteousness, which are to fill the earth with the fruits of prosperity and joy; and the peaceful employments as well as dispositions of the regenerated inhabitants of earth seem to be hinted at in that language which foretels the transformation of swords into plough-shares and spears into pruning-hooks, while the glad returns of their holy labours are shadowed forth in the panoramas of dry and thirsty lands being filled with water-springs, and the deserts made to blossom as the rose.

M. G. L.

Dwarf Pear Culture.

BY JOHN B. EATON, BUFFALO, N. Y.

Mr. Allen's recent article on this subject, it is to be expected, will create an awakening among the advocates of the quince stock. I observe, indeed, that one of the Cincinnatians is already aroused in its defence. I am a neighbour of Mr. Allen's, (although some miles distant from his *orchard,*) and have for several years had charge of one of the orchards to which he alludes, as having been planted nearly at the same time as his own. As I do not quite agree to all his propositions, (or rather conclusions,) I will give my "experience," as he has done.

My late father was the pioneer in the culture of dwarf pears in this vicinity; he having purchased and planted in the autumn of 1844 upwards of one hundred and thirty pears, most of which were dwarfs. At that time there was but a single dwarf tree in the neighbourhood, which had not, I think, then fruited.

The trees gave indication of succeeding well and fruiting abundantly; and their numbers were annually increased by successive plantings until they formed quite a respectable collection, embracing at one time over four hundred trees, and more than one hundred varieties, chiefly on the quince. The grounds containing a diversity of soils and exposures, a difference was soon perceptible in the growth of the trees; and on a gravelly elevation in particular, it was extremely difficult to *force* them to grow, and they would not be *coaxed.* In fine, we have had a varied experience, somewhat resembling Mr. Allen's, in its principal features, but far less discouraging, and wanting the fatal termination of his. Very many of the trees have done *well!* while many again have died. A large number perished with the blight during two or three years; but of late it has quite disappeared. Quite a number failed from some cause which I could not at first determine, but afterwards satisfied myself that it was from being worked upon an unsuitable stock, probably the common quince.

After thirteen years' experience, I am satisfied that dwarf pear culture *can* be made profitable; but that it requires the following conditions in order to make it so: The *soil* must be strong and rich, and kept in good condition by manuring. It must be well cultivated, and not laid down to grass. The trees should be planted as closely as possible—say six by twelve feet apart—and they *must* be pruned. If not carefully pruned once or twice each year, they will undoubtedly run to wood instead of fruit; and not only *that,* but their heads, instead of branching at one or two feet from the ground as they should, will be at standard height, and the trees being top-heavy will be continually blowing out of the ground, requiring an infinite quantity of labour and trouble to keep them in an upright position.

As Mr. Rivers well expresses the idea in his last article, "it should be strictly a pear *garden,* not a grass *orchard,*" and in this nutshell lies much of the truth of the whole matter.

Of the six pears of which Mr. Rivers selects, I should not place much reliance upon either Beurré d'Amalis or Vicar of Winkfield, (or Le Curè;) having rarely eaten one of the former which was of good flavour, and *never* one of the latter which was more than *passable.*

I have much confidence in Louise Bonne, Beurré Diel, and Easter Beurré, but do not consider Duchesse d'Angouleme as always reliable, although from its magnificent size and fine flavour, one can afford *sometimes* to have but a few specimens.

I should add to the above list with great confidence, Belle Lucrativé, and Surpasse Virgalian, both of which are of the highest flavour, and, so far as I have seen, good bearers.

If I were now to plant a pear orchard, I should arrange the rows in quincunx order, ten feet apart; placing *standards* at intervals

of about fifteen feet, filling the alternate spaces with *dwarfs*. I would prune *every one* of them rigorously in pyramid form, until the standards encroached so much upon the dwarfs, as to render the removal of the latter expedient, when the former might be allowed to grow more at large. In this way I have no doubt that, by selecting varieties judiciously, a fine return would be made to the planter.

[*Horticulturist for July.*

THE TULEYRIES, ITS ARTESIAN WELL, GRAIN. &C.

Yesterday we came through the elegant property of Col. Joseph Tuley of this county. First we halted at the well which is being sunk for a constant supply of running water. This well was begun in the bottom of an old one sixty-four feet deep. And they have now attained to the astonishing depth of five hundred and sixty-five feet. The rock has been continuous, though changing its character several times. At first there was the blue limestone; then many kinds and colors of sandstone, next came a gray limestone, and then a blue, and finally a gray of the hardest quality. In the first, four feet a day could be attained; in the intermediate lamina as much as six at times, then again two and two and a half in this hardest gray rock. The geological formation of the earth in these parts might well be ascertained from this well. Specimens of the different lamina should be carefully preserved. The drill is two inches and a half in diameter. The washings have been brought up by water from the different fissures, so that there has been no necessity of pumping. It is thought running water will be attained after a while, and perhaps it will spout twenty feet out at the top. If so, this will be a great curiosity as is already this wonderful estate. The running water from this well it is thought will add ten thousand dollars to the value of the property. The operation of boring or drilling proceeds very smoothly, and for aught that appears the crust of the earth might be bored through and let out either fire or flood.

The wheat which Col. Tuley has in cultivation is another curiosity. The astonishing breadth of eight hundred acres has he to harvest. And such wheat as it is,—is only equalled in this garden spot of the earth—Clarke County. Fallen down, and tangled and matted—too heavy to stand up—it presents an astonishing appearance. One field is of a beautiful new French variety, for a year or too carefully nurtured in the Colonel's garden, called the Noe wheat. This is a fine large vigorous looking wheat, as thick as possible, but struck with rust—like too much of the other, we are sorry to say—partly from being so luxuriant the air could not penetrate. The Colonel also has over twelve miles of stone fencing on his farm and continues to construct. This he considers an important operation, inasmuch as it at once clears the farm of rock, saves the timber and avoids the necessity of making rails—the rails which are replaced by the stone being amply sufficient for all the purposes of refitting the old rail fence. Perhaps more attention should be given by others to this branch of farm culture.

[*Clarke Journal.*

Spayed Cows---Important to Dairymen.

It is well known to dairymen that the milk of cows is liable to great changes, owing to the condition of the cow previous to and during the period of gestation. Milk taken from a cow while in heat, must be unhealthy and injurious to children and others who partake of it, and it can hardly be less so during the period of gestation. It would seem unnatural to take milk from cows during the more advanced stage of this period, as is often the case. Spaying has been but little practiced in this country, but where it has been adopted it has proved of great value, not only while the cows gave milk, but when they were turned out to fatten. The operation is not a difficult one to a person familiar with the anatomy of the cow, and may be easily learned by any one who will give the subject due attention.

The following facts are given by M. Delamare, proprietor of an extensive milk establishment in Paris:

THE MILK OF SPAYED COWS.

"The milk is produced from cows which, after the fifth or sixth gestation, and five or six weeks after calving, undergo an operation which consists in the removal of the ovaries, thus rendering the cows henceforth incapable of reproduction* * From this time, as happens to the ox, the animal changes in its nature and its milk, which we have named milk of

* The spaying of cows was known in remote antiquity. In modern times the practice dates back about twenty-five years, with the design to increase the quality of milk in cows. In 1830, Mr. Winn, Natchez, Miss., applied it with advantage in the production of milk. Mr. Winn proceeded by the cesarian operation, which is still practiced in the U. S.; but it presents serious difficulties, resulting occasionally in the death of the animal. In France, M. Charlier, Veterinary Surgeon, executes the operation without external incision, and renders the chances of mortality much less.

spayed cows, is free from all perturbations. The spayed cow does not undergo those disturbances arising from being in heat, from gestation and perturbation, she is free from those many causes which produce such evil effects in the quality of the milk.

"In this new condition her milk becomes regulated, and, which is important to the farmer, lactation is maintained in full quantity, for a year at least, and is prolonged, diminishing in quantity, but increasing in quality, two and even three years when she is not too old, and is properly kept. When lactation has ceased, the cow, which has by a quiet and reposed life become considerably increased in flesh, may be delivered to the butcher in perfect condition, and the meat is superior to that of ordinary cows. By generalizing the spaying of cows, after the fifth or sixth gestation, there would be introduced into common use milk of an irreproachable quality.

"The milk of spayed cows gives more cream than ordinary milk. It is also richer in casein, which constitutes—a fact not generally known—the most nourishing part of milk. The butter extracted directly from the milk is delicious in taste; it testifies to the amount and richness of the casein it contains. This milk offers precious resources for the artificial raising of infants; it might be asserted that they will be better nourished; for the nourishment of infants, who give it the preference over other milk, we do not doubt that the mik of spayed cows will be principally used.

"Such is the milk introduced by M. Delamarre at his establishment for consumption."

Crops and Seasons.

From our Barnwell correspondent we have a late letter on these fruitful subjects. He writes:

We are still not satisfied with the condition of the season. We have had the winds of March blowing freely, for some time past, and the dews of night and evening have been quite too cool to be altogether grateful to the young cotton. It grows less rapidly than we could wish; and the exceeding dryness of the weather is beginning to tell unfavorably upon the more arid fields. The coolness of the nights is particularly well calculated to encourage the ravages of that loathsome little marauder, the cut-worm. He is terribly active upon the tender plant while the cool weather compels his activity. We need a warm spell to hasten his departure, or, as the negroes phrase it, "make him go down." They fancy he descends, but not to those *warmer* regions which make them tremble with apprehension. He goes into cooler latitudes. In the planting of cotton, when there is no scarcity of seed, there is provision for *him*. Enough is planted to satisfy his voracity, yet enable the planter to secure a sufficient *stand* for himself. It is quite a beautiful trait of agricultural humanity, that of making provision even for the marauder. You remember the old doggerel touching the planting of corn:

"Would you sow a crop,
Then in every chop,
Five grains should you drop."

The reasons are thus given:

"One for the cut-worm,
One for the crow,
One for the little bird,
And two to grow."

But the rascally crow, and the scoundrelly cut-worm, are rarely content with this allowance. They will sweep the entire hill, and long rows of hills; making terrible ravage—the one in early morning, the other in the silence of the night. And it is not merely cut-worm and crow—the whole tribe of birds and beasts prey upon the farmer, and rebuke his vanity and discourage his boasting confidence. The squirrel roots up his corn, rice and potatoes, as well as the crow. Even the dove becomes a thief in the opening of the season. He may be meek and timid, and sleek and sentimental, but "he's sly," and will slip into the corn fields, and in between the rice drills, and practice his peccadillos as dexterously as birds of a much worse character. The farmer, who has his gun ready for the crow, and hawk, and squirrel, relents knocking over the dove, who, at this season, walks in his paths with a trusting confidence which disarms his anger for a long time; but if he ever takes him in the act, then will he fiercely ruffle his feathers with small shot. The black bird, the red bird, and many others, are supposed to be rogues in grain also. The negroes sing:

"De black bird is de parson tief,
De red bird is de sodger horn;
De black coat and de red coat, bote (both)
Jis' (just) come for tief we people corn."

I say, it is a beautiful proof of agricultural humanity that, loathing the character of these scamps in professional garments, the benevolent farmer still makes provision for them. He reasons we may presume, somewhat in this fashion:

"God's sun shines equally on all—the just and unjust—the good and bad; the honest

worker, and the prowling buccaneer. Shall we not take our lessons from God's example, and do something for these profligates also? They are rogues, but they must feed; rogues in grain, but weed corn: young hawks must be fed." And so he sows five grains of corn in the hill, when he needs but two to grow; plants fifty seeds of cotton in the chop, when he requires but a single stalk, or at most, two,—This, my dear Mercury, is a benevolent philanthropy, which you citizens rarely adopt. Take a lesson, hereafter, from one of our simple farmers, who recognize the necessity of letting the rascals live, if only as a foil, by which to show off the superior virtues of your honest citizens. It is so pleasant to hear virtue congratulating herself on being quite unlike these wretched publicans and sinners! See the christianity, as well as charity, of the doctrine! Now, that your people have all become so virtuous, perhaps you need a consignment of doubtful characters. There are a few squatters in these parts, who require grain as fully, and who appreciate it as unscrupulously, as the crows and cut-worms. A few of these in your city, *now*, would be admirable subjects of curious study to those who are so ignorant of the character. It is a pity that you should not possess a few specimens of depraved humanity, if only to teach your young students—who revolt so often at the despotism which requires discipline where it is not required—what rare characteristics may still be found among less virtuous and more remote races.

With one more illustration of the philanthropy which is taught by agricultural life, I shall finish my scroll. The same farm-yard doggerel which prescribes five grains to each hill, in order that marauders, even, should have a share, pays some similar heed to benevolence, in setting eggs. Thus:

"Fifteen eggs under every hen,
Out of them you may reckon on ten:
Ten young chickens; the proper spoil,
To please the palate, and pay for the toil,
Growing for fricassee, roast and boil:
Three for the pip, the staggers and grip;
Two for the hawk—if he comes for a third,
Give him a bullet, and bag your bird."

Did you ever hear of the dialogue between the hawk and partridge? "Why do you always fly from me and hide under the briars?" quoth the hawk. "I am not your enemy! On the contrary, I am a great lover of all your family! Besides, my morals are unquestionable! I am a truly pious bird! my very motto is from the Bible." "Ah, indeed," answered the partridge: "and what is that?" "Watch and prey." "A very good motto, replied the partridge. "Well, I admire your morals, but curse your orthography!" Please apply this to your virtuous sinners, who serve Mammon under the name of Jehova—who too often mean prey, when they say pray—*i. e.*, if it be possible to find any such among you.—*Charleston Mercury, May 20th.*

BONES.

The efficiency of bones when applied as manure, depends upon a variety of circumstances. In the first place, the bones of man and animals consists of a certain animal substance, denominated *gelatine*, with certain inorganic matters. This gelatine is sometimes extracted, and used in the manufacture of glue. In this process of separation, the *residuum* is composed of the inorganic salts, which are so abundant or in such preponderating proportions to the other matter, that calcination does not destroy the original form of the bone, which remains the same after having been submitted to the fire, as before. It loses nothing by being burned, but its gelatine; though it appears more white, loses, of course, a portion of its original weight, and is more brittle and pulverable. In the bones of the mammalia and of man, the average amount of organic matter, is from 32 to 33 per cent. Of this about five per cent. is nitrogen; the remaining 67 or 66 per cent. consisting mainly of phosphates. (52 to 57 per cent.)

Berzelius presents the following analysis of bones:—

	Human Bones.	*Bones of an Ox.*
Animal matter (gelatine)	33.30	33.30
Soda and common salt,	1.20	2.55
Carbonate of lime,	11.30	3.85
Phosphate of lime,	51.04	55.45
Thoride of calcium,	2.00	2.90
Phosphate of magnesia,	1.16	2.05
	100.00	100.00

Pelzholdt, in remarking upon the efficiency of bones, when applied as manure, says:—

"It might be supposed that the nitrogen contained in the gelatine of bones, imparts to them their power of fertilising the soil. Experience, however, has proved that bones calcined and thus entirely deprived of their gelatine, act more advantageously on the soil than bones in their natural state. The presence of the nitrogenous organic substances of the bones, therefore, must be considered to act as an obstacle to the rapid manifestation of their fertilizing influence. The phosphates of bones can only become capable of being assimilated by plants after the destruction of the organic substance by decay or putrefaction. This destructive process may be exceedingly protracted in bones, and may make their application as manure, in their uncalcined state, utterly inadmissible for the purpose of manure."

On every farm there is usually more or less of bones to be found, and these should be saved and applied to the soil. By dissolving

them in sulphuric acid, or very strong alkali, or by placing them in the compost heap, after dividing them by the hammer or axe, they will be converted to a valuable use, and at small expense. Ground bones, or crushed bones, which in some localities can be purchased of regular dealers in the article, are one of the best fertilizers known. Their beneficial effects upon the turnip crop have secured for them a very high degree of popularity in Europe, and from the same cause, they are beginning to be appreciated in this country.

As one of the principal advantages resulting from the application of bones to the soil, are derivable from the supply of phosphates, the bones of the scaly tribe, which contain a a variable per centage of phosphates, are also valuable, though in a less degree, than the bones of animals. The following table shows the amount of phosphates in the bones of the several kinds of fishes named:—

	Per cent. of Phosphates.
Pike - - -	54
Codfish, - - -	50
Shark, - - -	33
The teeth of shark, -	53
Shells of the Crustaceæ, Lobsters, Crabs, &c., -	5.7
Crab's claws, - -	14
Oyster Shells, - -	1.2

W. P. B.

[*Germantown Telegraph.*

From the Germantown Telegraph

The Sun-Flower.

Among the many productions of the garden, the sun-flower still, in many places, holds a prominent place. It is regarded with a sentiment almost of religious veneration by some, and is nourished with a degree of care and scrupulous attention bestowed upon no other plant that can be named in the floral catalogue. And yet, it is not elegant—it is not valuable, for very few make any use of it whatever. Lately much has been said, written and published in favor of its cultivation as a field crop, the seed being replete with a bland and valuable oil, which is said to afford an excellent substitute for sperm and linseed in burning and painting. It has also been ascertained by experiments carefully conducted, and most conclusive in their results, that it (the seed) possesses highly nutritious properties, and is susceptible of being used economically as a food for swine, hens, and other domestic fowls.

A friend who is an experimental as well as practical agriculturist, in a letter now before me, laudatory of this plant, says:

"The more I see of the sun-flower the more I am confident of its decided claim upon popular attention. Any soil capable of producing a tolerable crop of Indian corn, will secure a good yield of sun-flower seed. The cultivation of the two are strictly identic from first to last; but the sun-flower, while it does not exhaust the soil in any greater degree than that occasioned by the corn plant, will, if judiciously managed, produce nearly double qauntity of crop. This is not the crude unqualified assertion of a mere eutopian theorist, but actual FACT. Any one can demonstrate its correctness who will but make the trial. At first, I was induced to be somewhat skeptical, and the more so, perhaps, from never having heard of its being used in feeding animals by any one. In order, however, to supply the basis of a perfectly legitimate appreciation of its merits, I commenced cultivating it—on a limited scale at first—and studying its physiological peculiarities and habitudes with as much care as the naturalist regards the movements of a newly-discovered insect. I planted in "waste places," in the corners of fields, by the side of the lane, and, indeed, wherever a few seeds could be got into the soil. The result of this commencement was highly satisfactory, and since that time [illegible] a season has gone by in which I have not raised and fed more or less of the [illegible]—my field crop often amounting to one hundred and fifty bushels, and equal in value for feeding domestic animals to nearly double that quantity of corn. The details of the practice I have seen fit to adopt, I must reserve for a future communication."

It is sincerely to be hoped that those who possess the means of giving this plant a fair trial, will not fail to do so. W.

Lancaster County, July 2, 1858.

THE BORER.—Mr. Travis, of Natick, Mass., states that a mixture of one part salt, two parts fresh slacked lime, and two parts of soft soap, applied to the lower limbs and the body of the apple tree, after first scraping the tree gently, will prevent the borer from depositing its eggs in the bark. It should be applied about the middle of April. He states that the success of this remedy is complete.

FRECKLES may be removed by the following ingredients made into a wash: One ounce of rectified spirits of wine, a teaspoonful of muriatic acid, applied with a camel's hair pencil two or three times a day.

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