THE

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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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For the Southern Planter.

A Premium Essay on the Practical, Economical and Profitable Management of a Farm of 300 Acres, devoted to the Cultivation of Corn and Wheat as Staple Crops.

BY EDMUND TAYLOR.

[*Concluded from March Number.*]

When the fodder is ripe, it should be pulled and *tied* in such a manner as to leave an end to the withe of sufficient length to hang the bundle *on* the stalk, in the cleft where the ear shoots from the stalk. When these bundles are sufficiently cured, collect and shock; this is essential before stacking, as the fodder undergoes a sweat, and this should take place in the shock and not in the stack.

Tops to be cut at the usual time, and in the usual manner, but I would recommend a slight but *important* change in the usual manner of shocking the tops. The usual plan is to shock and tie them *around* a stalk of corn; this plan is objectionable, because it causes a loss of time in their removal. When this is done, the shock must be *untied* and then laid in parcels on the rope, or vine, for removal, thus consuming a good deal of time at each shock.

Instead of this plan, I recommend that the tops be shocked in the *middle* of the row, between the drills, and *not* round a stalk of corn. Thus, when they are to be removed, the hand lays his rope, or vine, along-side, and turns the shock immediately upon it—an instantaneous operation.

Blade-fodder is more valuable and nutritious than many suppose it to be, and ought, therefore, to be carefully preserved; slovenly stacks are an eye-sore to a good farmer. To insure this, I propose that the bottom of the stack, for a foot or two, be made of tops—as less valuable—and then the blades carefully stacked above, the stack to be furnished, for a foot or two below the apex, with tops also.

This plan effectually secures the blade and does not injure the top fodder. Any tops left after stacking the blades, can be ricked or stacked to themselves. If convenient, a bed of rails should be laid for each stack, and where these cannot be obtained, bushes form a good substitute.

Whenever it is practicable, both kinds of fodder should be stacked near the edge of a field road, whence they may be removed without injury to the wheat crop.

The management of the shucks cannot be described without explaining the mode of gathering and preserving the corn crop, and though the latter is not required by the schedule, yet I deem it important briefly to notice the subject. As soon as the corn is ripe enough to cut, which generally occurs about the time the fodder is properly secured, I advise the following plan as decidedly more expeditious than the ordinary one of chopping down the stalks with a hoe.

To a handle of some two or three feet in length—as the operator may prefer—attach a scythe-blade knife at right angles, to one end of the handle. This gives a kind of knife-hook, which being applied to the bottom of the stalk with the back of the knife touching the ground—to insure cutting the stalk close to the earth—and then jerked upward quickly and smartly, severs the stalk rapidly and effectually. The left hand of the operator grasps the stalk and throws it when cut into a pile like a top-pile, all ready for removal.

This plan saves time and labor, for under the common system of cutting off with the hoe, the stalks fall helter-skelter, and a set of hands is required to pile and straighten them before they can be removed. It saves the work of one entire set of hands, and a cutter will sever at least one third more corn in a day with a knife—such as I have described—than with the inefficient and tiresome hoe.

I prefer removing the corn to an adjacent field, if possible; this can generally be done on a small farm; if, however, it is found impracticable, I advise by all means to remove and shock it on the sides of the field road, and in the spring to seed the land thus occupied in oats. As soon as the wheat is seeded, the husking or shucking of the corn should begin.

On a small farm I would advise that the ear be pulled off *in the shuck*, piled and then shucked; securing the shucks in a rail rick covered with tops or straw, and putting the corn in pens to dry thoroughly before being housed. When the corn is dry, separate the good and bad, *measure* and house. In no case—on a small farm, where every edge should cut—omit carefully measuring the corn crop; you then know how much you have for sale, having previously ascertained the amount necessary for farm use.

While housing, select with care the largest and most perfect ears for seed, and keep them in an upper room or loft. With a small force, it may seem at the first blush almost impossible to shuck the corn in the way proposed, but by pulling off half the day and shucking the other half, the operation is easily accomplished. A man can readily shuck five barrels per day; in fact, I have

myself known men who were tasked at this rate, to finish their task by two or three o'clock. The farm hands and the manager—for he is expected to lend a helping hand at such times—making six in all, by shucking half the day, will husk fifteen barrels, or three hundred barrels in twenty working days.

Having fully, and I trust, distinctly discussed the cultivation and preservation of the corn crop and its provender, I shall now proceed to the wheat crop.

One of the 40 acre fields is to be fallowed for wheat, and this, with the addition of the corn land—also to be seeded in the same crop—will give 80 acres in wheat.* Hill Carter (1874) advises the corn land in wheat and one of the fine fields to be mowed for hay to save labor.

The fallow should be made with three-horse plows, and immediately after threshing the wheat. It should be completed in July, *if possible;* certainly not later than the 20th of August. Other things being equal, early fallows are decidedly more productive.

In our climate, it is advisable to seed the wheat crop between the 20th of September and the 20th of October. If the time included in these dates is not sufficient, then I would recommend beginning on the 15th of September, so as not to continue the seeding under any circumstances beyond the 25th of October.

I would pursue the following plan in preparing the fallow for seeding:

Early in September the land should be stirred and thoroughly torn to pieces with the bull-tongue cultivator, and I would then follow on with the harrows, making the tilth fine and even and free from any oversized clods.

If necessary, the clod-crusher must be used to break hard clods that resist other implements.

Then use the drill, putting in one bushel and a half of seed per acre; an approved kind of white wheat preferred for fallow land. Some farmers think one and a quarter bushels enough, but I think the most successful wheat growers will sustain my opinion, especially where the *drill* is used. Cahoon's Broadcast machine for hand — price $ 10.

It is a mistake to suppose that thin land requires *less* seed than rich. The reverse is the case, and for the obvious reason that thin land puts forth few branches, while rich land makes up for a deficiency in seed by its fecundity in this respect.

When the fallow is prepared and the drilling begun, I would turn to the preparation of the corn land.

Here again I would use the bull-tongue cultivator, running *across* the corn-beds. Lay off the rows with a stick or coulter for broadcast seeding, parallel with the direction of the corn rows and harrow in the wheat in the same direction. The harrowing to be done thoroughly by running twice in a row. The drill also may be used on corn land, by harrowing and then drilling. Many farmers prefer this to broadcast seeding.

I prefer an early red wheat for corn land, and would again recommend one bushel and a half per acre.

Seed should be changed every 3 or 4 years, R. T. Ragland.

* If thought best, a portion of the corn land might be reserved for oats. For my own part, however, I am by no means partial to the oat crop.

I deprecate *reversing* corn land for wheat. The fall grasses—such as crab grass and fox tail—if turned under will *ferment* without *decaying*, and injure the wheat by throwing out a superabundance of acid. In addition to this objection, reversing the soil and turning under the fall grasses, is apt to make it too porous, and consequently subject to saturation from water and to spewing up, which exposes and eventually destroys the roots of the wheat.

The wheat should be cut as *soon* as ripe, avoiding shattering from *over* ripeness. The reaper to be used wherever available, and the wheat well bound and carefully shocked and *capped*.

Before proceeding further, and while discussing the cultivation of wheat—which shows the beneficial results of it more perhaps than any other crop—I propose to say a few words on the subject of draining. The subject is one of vital importance in the profitable management of a farm, and one that is entirely too much neglected in Virginia. The intelligent farmer, who is at all conversant with English farming, and the extraordinary benefits derived from a system of thorough draining in England, will need no demonstration to prove its utility.

Every farm should be efficiently and *thoroughly* drained by open and secret or underground ditches. The underground drains to be made of rock or tile, for the slovenly plan of logs rarely succeeds and eventually requires tearing up and repairing at great cost in time and labor. A firm bottom must be sought, and if not provided by Nature, an artificial one of thick plank must be constructed to receive the rock or tile.

Make the ditch *deep*, so deep that the plow can never touch or disturb the material used.

The ditch must be left open for sometime to ascertain if it is effective; and when filled in with rock, the upper surface of the rock should be firm and level as possible, and reversed sod, weeds or straw carefully laid on before the earth is thrown in. The earth then becomes firm and compact, and there is little chance of the interstices of the rock filling up.

Tile of course—as it acts by absorption—requires only careful laying and filling in. See Waring - Norton - Deane.

Open ditches must be of sufficient width, depth and fall to carry off rapidly the ordinary, and as a general thing, the extraordinary supply of water.

Especial care should be taken to make open ditches as straight as circumstances will permit.

After a rain of any duration or violence, the open ditches should be examined and all obstructions to the free passage of the water removed, and all injuries to the ditch repaired at once. So much for general and primary draining.

I come now to special and superficial draining in its application to the wheat crop.

A plenty of drains should be run in all damp soils where wheat is seeded, this ought to be one of a farmer's axioms. Let them have ample slope and depth, and open well into one another and into the main ditches. The sides of

drains in wheat land, should be neatly and carefully smoothed down, and all falling dirt and clods thrown out of the drain itself. During the winter and spring, these surface drains ought to be examined occasionally and any obstructions removed and inefficient construction rectified.

I beg leave to call the readers attention to the following remarks on the subject of draining, which I find in a periodical of the day, and which present the whole matter—as it were—in a nut shell:

"One of the great hindrances to good tillage and productiveness, and often where it would not be imagined to be the case, is surplus water in the soil. This renders the land heavy, inclines it to bake and crack, and keeps it too cold for the roots of the crop. Besides, if much water must evaporate off the surface of the soil, this of itself occasions increased cold; but if drained away on, or beneath the surface, this cause of cold is in a large degree removed. A soil saturated with moisture, contains at least one fourth its bulk of needless water. Taking it to a depth of one foot only, this is equivalent to three inches depth of water; and this gives to every square rod eight hogsheads, and to an acre, not less than 1,280 hogsheads!

"Think, then, how much the farmer is losing who allows his soil to be chilled by evaporating so much needless water, the rooting of his crops retarded, and the powdery and porous quality of the land prevented to a corresponding extent. It has been calculated that the heat required to convert the surplus above supposed, on 100 acres to vapor, would be sufficient to boil 640,000 hogsheads of water, if properly applied.

"It will surprise the unthinking farmer, who has sweated and ached over his fields for years, thankful for very moderate crops, that one of the greatest obstacles to his better success has been all the while just such an undreamed-of circumstance as this, of too much water on his land.

"Still more will it surprise him to learn that the greatest need of draining often exists on what is called *upland*, but which may be cold till late in the season, and produce a stinted crop. Of such fields and farms there are tens of thousands in our country. They are deceitful, because the eye, and even the plow, does not always show their true character. They are already brought under excellent cultivation, perhaps, in every respect but this—they have too much water in them.

"Drainage of any kind is good, whether by ditches, mole, or tile—whether open or under draining. Wherever the latter is not forbidden by the condition of soil or some other circumstance, it is best. With hardly an exception, it enlarges the production of the land; it increases the yield of all manner of crops. It warms the soil, forwards the crop, and so protects against insects. Where surface streams are scanty, it collects from a large area, and discharges, at some practicable point, an artificial stream—a great advantage in some sections. It insures a gain in fertility, by inviting the rains, and what they wash out of the air, all downward, depositing their contributions in the soil, and not leaving

them to flow off the surface. It removes excessive dampness and stagnant water from beneath house, barn, and pastures, and so insures better health to the household, and to the domestic animals on the farm."

In reference to threshing the wheat crop, I would advise—where the force is small—that the wheat be first hauled together and stacked in each field. The machine I have already mentioned—combined thresher—then to be used.

With a small force as we have in the present instance, it will be necessary to stop time enough in the evening to haul and house the wheat in the barn, rick or stack the straw, and pen the chaff. It may be necessary to hire some help at this time and in harvest, although I am inclined to believe that with the assistance of the manager and the woman and girl—who must be extra smart and active at such times—the work may be accomplished without aid. But with the assistance of a hand or two, at least one hundred and twenty-five bushels of wheat ought to be threshed and housed per day, and the straw and chaff of the same properly secured. The chaff must be preserved in a rail pen well covered with straw, and both it and the straw should be secured against the depredation of stock by a temporary enclosure.

Let it be a rule never to thresh wheat in damp weather, and to be careful to spread it out as thin as possible in the barn, and to stir it up every day or two until all danger of heating is over. Before delivery, it should be passed through a good fan and completely cleaned of injured grains and all kinds of foreign matter. Once fanning is generally sufficient, when threshed and cleaned by the machine I have recommended.

Every three or four years the seed wheat should be changed, and new seed ought *always* to be procured from a locality *north* of any given farm.

It will be recollected that I have separated four lots of five acres each. The location of these lots should be near the farm buildings, and their cultivation must—in the light work—be chiefly done by the woman and girl in their spare time, aided of course when necessary by the legitimate farm hands.

One of these lots is to be cultivated yearly as a truck patch, for raising vegetables for the hands and stock. Peas, beans, rutabaga, common turnip, pumpkins, cabbage, carrots and sugar beets should be raised on this lot, to be followed in the Spring by oats.

I have said nothing as yet about the grasses and home-made manure; a few words on these subjects will illustrate my views.

All the arable land not in cultivation is to be well set in grass; I prefer a mixture of Clover, Timothy and Orchard grass. If one fails, the others will probably succeed; and thus, under all circumstances, a stand will be obtained.

Nothing is said in the Schedule of bought manures, but the use of plaster is clearly inferred, as grass cannot be successfully raised on other than meadow land, without the aid of this valuable and cheap fertilizer.

Grass seed should *always* be rolled in plaster previous to seeding. The best plan is to wet the seed and then mix with plaster. By this plan every seed be-

Plaster the grasses immediately after harvest [illegible] – aids against drought.

comes coated with it, and thus the "young and tender plant" carries with it its own food. I have scarcely ever seen the grasses fail when this plan was adopted.

I advise that one half of the required seed be sown in the fall and the other moiety in the Spring, thus taking a double chance for a good stand.

I would turn under some grass in a green state on the wheat fallow, but prefer the land to be well trampled, and the first growth of grass to be beat down and ground up before plowing.

To attain this object, I would not graze the field set aside for fallowing until the grasses were getting into the brown state, and would remove the stock a sufficient length of time before plowing, to allow the grass to spring up again to the height of five or six inches. To aid this resuscitation, apply a slight sprinkling of plaster.

All the grass land must be sprinkled with plaster in the Spring. If it is equally and properly distributed, a very small quantity will suffice.

The lots are to be seeded in grass when the oats are seeded.

The grass on fields to go in corn should be thoroughly trampled to pieces, and the field clean of grass before plowing.

Turning under *green* vegetable matter—to be buried during winter—is of no advantage to the corn crop. It does not rot, but breeds innumerable worms, which come forth in the Spring and effectually destroy all chance of a good corn crop.

Some farmers turn under cover by making each furrow-slice lean against another at an angle of 45°, and not reversed; but this is not only difficult to do, but is in fact *bad* plowing. I decidedly prefer the land to be completely *reversed*, and the turf to be thoroughly trampled and *breath-scented* by stock.

Under the divisions indicated and the system suggested, two of the forty acre fields, and two of the five acre lots, besides the three acres of meadow, will always be in grass; the fields and one of the lots I set aside entirely for grazing, while the other lot and meadow should be reserved for hay, to be grazed after the hay is cut and the grass somewhat recuperated. After the wheat and oats are severed and removed, two more fields and one lot can be moderately grazed to aid in supporting the stock.

In the application of home-made manure, I would most *earnestly* recommend that it be applied as a top-dressing during the Winter and Spring on the poorest parts of the grass land. It might be well, however, in case the corn land is not rich enough to bring a good crop or any required quantity, to manure the most indifferent portions in the hill, and thus—to use a vernacular phrase—"*make a cash transaction of it.*"

Experience all over the world—so far as I am informed—indicates top-dressing as the most beneficial and *economical* method of applying manure. The question of the application of home-made manure to tobacco, is of course excluded in this essay and entirely foreign to the subjects under discussion.

Though not required to touch on the subject, I deem it essential to a proper

discussion of farming interests, briefly to notice the management and contribution of stock to the profits of farming. It is unnecessary to say anything of their management during the season when they seek and obtain their food at will, but a brief notice of the sheltering and feeding time may not be inappropriate.

The lots should be constantly littered with cornstalks, and the racks—as I have already mentioned—must always be filled with food; in addition to this, I would recommend a regular supply of boiled or steamed food. Shucks now come into use. They should be cut up, mixed with chaff and the vegetable roots and pumpkins—also cut up—and a little meal added, then steamed or boiled in an ample supply of water. This wash given to cows morning and night, will keep them fat and add to their milk as effectually as the grasses do in the summer. I would treat the oxen to the same food, only reducing the mixture to a thicker compound than that given to the cows. Short corn may be used in this wash.

The sheep must be fed occasionally on chop, a little fodder or hay and raw-cut vegetables. The calves to share the commons of the sheep.

In good weather the stock should be driven to pasture every day to crop any grass that may be growing. This arrangement contributes to their health and gives them exercise.

In feeding stock of all kinds—horses and mules included—I would most earnestly advise, *never* to feed on corn in the natural state, but to use it in all cases, and under all circumstances, in the form of meal, and then to be mixed with cut food or chaff into a damp chop. Meal goes farther than corn, and is therefore more economical, it is more easily digested, and hence more nutritious. Oats should always but cut up in a cutting-box.

I would say a few words here to the young farmer. Should he, on taking charge of a farm, find it materially injured by the exhausting system pursued by his predecessors, let him not be dismayed by the difficulties before him. *These are not to be overcome at once.* Let him begin with a *system,* the best he can devise, and adhere to it for a time at least. If a suitable improvement is suggested, unless he can *substitute* it for something already determined on, it will generally be best for him to decline trying it until he has planned a new campaign. Many of these improvements are good in the abstract, and good for farmers differently situated from him; but, unless he can *weave it into his general plan,* he had better let it pass as an empirical crochet. Let him not forget however that Agriculture is no longer entirely empirical, but has become a science upon which many other sciences are dependent. Let him read, observe and enquire, and he will find "remedies for all the ills that land is heir to." Apply these remedies prudently and judiciously, and he will soon change the desert into a blooming garden.

I have now given a statement of all important matters connected with the management of a farm of the assumed size, and possibly done all required by the schedule; but I deem an estimate of the crop, income from all sources, and legitimate farm expenses—fairly made—to be a necessary addendum, in order

to place the whole subject before the intelligent reader in a clear and satisfactory manner, as well as to call the attention of the Virginia farmer to the greater comforts and greater profits—in proportion to size—of a small over a large farm.

Owners of large farms look to the *general aggregate*, while the owner of a small one is compelled, from the nature of things, to look to the *special* and *individual* results.

A man who cultivates *one* acre in corn, will, as a general thing, make more per acre than the man who cultivates five hundred acres of similar land in the same crop. The per centage, therefore, of crops, and of profits, upon a small, are greater than upon a large farm. This seems to be a wise dispensation of Providence, for if this was not the case, the poor man would find it impossible to sustain his family on his few acres.

Although I have carefully endeavored to make fair and just estimates, I wish the reader, nevertheless, to bear in mind the marked difference, in percentage, between small and large farms, to which I have already alluded. It must be manifest to every sensible man, that these estimates cannot be made in reference to any particular part of the State, but must be of a general nature, subject to such modifications or enlargements as may, in the opinion of farmers, suit their particular locality.

Let us now see at what the crops, expenses and profits, may fairly be estimated, assuming that the land is of fair quality.

We have stated that the number of stalks of corn to the acre—fractions in these estimates to be omitted—is 5460; estimating the amount of shelled corn per each stalk, at *less* than *half* a pint, gives us 7 barrels per acre, and 280 barrels for the 40 acre field. 4½ ft × 1½ = 6453 stalks. Buel.

The wheat crop, on the two fields—80 acres in all—estimated at 15 bushels per acre, gives 1200 bushels for this crop. Nine cows, estimated to yield less than half a pound of butter per day, per cow, or say, four pounds a day for the 9 cows, will give us 1460 pounds of butter annually.

With a good breed of hogs, careful attention, and the feeding of the unconsumed buttermilk to the pigs, it is fair to say, that at least 35 hogs should be annually slaughtered, weighing an average of 175 pounds each, and 6125 pounds in the aggregate.

Forty Merino sheep ought to yield a clip of four pounds of wool each, or 160 pounds for the flock.

Making allowance for accidents, and a few for the manager and hands, there should be 30 lambs and 5 veals for sale each year.

Now let us see what amount of these products is required for farm use; what amount to be sold, and the average prices; what the expenses of the farm and the balance in money.

I deduct 150 barrels of corn for farm use. This allows 2 barrels for each hog slaughtered, or 70 barrels for hogs; 32 barrels for meal, an average for each man of 1½ pecks per week, and for the women 1 peck; and also 2½ pecks for

the manager. This leaves 48 barrels for seed and for the stock, in addition to the oats and refuse grain. Taking, then, 150 barrels from 280, leaves us 130 for sale, which, at four dollars a barrel, yields $520.

Deducting 200 bushels of wheat for seed and for flour, for the manager and hands, and we have 1000 for sale, which, at one dollar and twenty-five cents per bushel, gives us $1,250.

Reserving 1500 weight of pork, for the use of the farm hands—over 4 pounds a week for each hand—and 500 weight for the manager, 2000 weight in all, and we have 4125 pounds for sale; this, at 8 cents per pound, gives us $330.

One hundred and sixty pounds of wool, (Merino,) at 40 cents per pound, yields $64. Thirty lambs, at two dollars and a quarter each, gives us $67. Retain 260 pounds of butter for the manager and hands, and we have 1200 for sale, which, at 20 cents per pound, gives $240.

Five veals, at $5 each, will bring $25.

Adding these sums together, we have $2,496 as the aggregate amount of sales.

Now let us note the expenses: Manager's wages $150, wear and tear, clothing, plaster, grass seed, taxes, blacksmith's account and medical bills, &c., &c., estimated at $346. This leaves a nett balance to the owner's column, of profits, of $2,000, which is 10 per cent. upon $20,000, or a fraction over 6 per cent. upon $33,000.

When it is borne in mind that I have excluded the lard, extra vegetables, poultry and fruit, from these estimates—which may be applied to the column of profits, or to farm expenses, as the reader prefers—I think even the most skeptical reader will admit that my estimates are in the bounds of reason and probability. It is scarcely necessary to suggest to the intelligent farmer, that these profits might be greatly augmented by the judicious use of the bought fertilizers.

A very distinguished author has observed, that "it is pleasing, with the elder Pliny, whose judgment is sanctioned by Leibnitz and Gibbon, to believe that scarcely any book was ever written, (not positively immoral,) which did not contain something valuable; some contribution, however small, to the general stock of human knowledge, and still preserved, in other forms, for succeeding ages, though the book itself, like its author, had become food for worms; or something which tended to mould and influence some contemporary mind, destined to act with greater power on distant generations."

May I not, then, hope that some of the suggestions contained in this essay, will prove beneficial in some quarter to the agricultural interests of our dearly loved State? I trust it may be so, for I shall feel far more satisfaction in contributing, however humbly, to the advancement of "the nursing mother of the arts," than in coming off victor in a hundred contests, either in the Literary or Agricultural arena.

NOTE.—We are requested by the author to inform the reader, that the strictures on the use of the "*Rafter Level*," in that portion of the foregoing essay contained in the March

number of this Journal, were not intended for that instrument, but for another, known as the "Horizontal Level," the name of the former having been inadvertently inserted instead of the latter. We commend this admirable essay to the careful consideration of our readers, who will, no doubt, cheerfully unite with us in the expression of the hope, that the pages of the Planter may be frequently enriched by communications from one so competent to enlighten and instruct the brotherhood of farmers on subjects pertaining to practical Agriculture.—[Eds. So. Planter. Compare John Johnston's system for which see Fur. Reg. 1857 p. 403-4; Ch. Gent. Jan. 3d 1861 p. 11 — Ibid. Feb. 14th 1861.

Notes of a Microscopical Examination of "Measled" and other Pork.

By William Smith, F.L.S., *Professor of Natural History, Queen's College, Cork.*

The subject of the present paper has of late excited much attention in this locality, the trade of the port of Cork and the industry of the neighboring counties being immediately connected with the produce and export of provisions, a main portion of which consists of cured pork.

The disease in pigs popularly known as "measles" (though without any resemblance to the complaint bearing the name in the human subject) is one of frequent occurrence in the South of Ireland, and as its presence in the flesh of the animal is usually regarded as detrimental to its value as an article of food, the market-price of the commodity is thereby lowered, and the profits of the producer proportionally diminished.

Questions connected with the supply of provision to the Crimean army having called increased attention to this subject, an attempt was lately made by the provision-merchants of Cork to arrive at more certain conclusions respecting the nature and extent of the disease, and its precise influence on the character and condition of the flesh affected by it.

Having been invited to assist in this research, by reporting on the microscopical appearance of the disease, and the meat affected by it, the following notes of a careful examination of fresh and cured pork, supplied to me, were my contributions to the inquiry:

The facts noted are not new to science, the subject having attracted the attention of several German, French, and British physiologists, and the results of their investigations being for the most part similar to my own.

The matter has not, however, been discussed in the *Micr. Journ.*, and the following record of independent observation, and personal inquiry, may interest the readers of this magazine, and possess corroborative value when taken in connection with the more important investigations of other naturalists.

Nineteen specimens were supplied to me, viz.:

6 of healthy fresh pork from various parts of different pigs;
6 of fresh muscle, "slightly measled;"
6 of fresh muscle, "badly measled;"
1 of cured pork, "badly measled."

The "measles" are occasioned by the presence of a parasitic worm, known to physiologists and anatomists as the *Cysticercus cellulosæ*.

This worm, as it occurred in the muscle or flesh of the pork supplied to me, consists of an external bag or cyst of delicate rugose membrane, enclosing the animal of the *Cysticercus*, retracted within its folds; the space not occupied by the worm being filled with a clear watery fluid.

Pl. II. fig. 1, represents the natural size of the "measles" in fresh muscle; fig. 2 the same in stale or salted pork; and fig. 3 the same from fresh muscle, magnified 6 diameters.

The animal of the *Cysticercus*, when withdrawn from the cyst, within which it lies invaginated, and curled up, in all the specimens, consisted of a slightly enlarged head, fig. 4 *a*, and a neck formed of numerous rings, fig. 4 *b*, gradually enlarged into a bladder-like vesicle, fig. 4 *c*, which constitutes the body of the worm.

The neck and body of the *Cysticercus*, are filled with a mass of minute transparent bodies, which a further examination leads me to regard as cellules discharging the function of assimilation, *i. e.*, the material endosmosically absorbed by the cyst and bladder-like vesicle into the substance of the *Cysticercus*. The form of these cellules is usually that of a flattened circular disc, and their average diameter one fifteen-hundredth of an inch, but neither their size nor form is constant, some being linear, other irregular in outline, and many not exceeding one three-thousandth of inch in diameter.*

The head of the *Cysticercus*, is provided, at its extremity, with a circlet of about 24 hooklets (fig. 5 *a*), immediately beneath which are situated 4 circular organs (*b*, *b*), afterwards more fully developed in the mature condition of the *Cysticercus*.

The hooklets upon further examination with higher powers of the microscope, are seen to consist of a stem fixed in the flesh of the head (fig. 6 *a*), a barb (fig. 6 *b*), and a sickle-like point (fig. 6 *c*).

The *Cysticercus*, as above described, constituting the "measles," is embeded *between* the fasciculi of the muscle, and occupies a chamber formed by the inflation of its cyst.

The cyst which in a fresh state fills the entire chamber, on the death of the pig parts with its contained fluid, which permeates the surrounding tissues.

The chambers then collapse, and the muscle in consequence becomes soft, and flabby to the touch.

The "measles" in the specimens supplied to me were all visible to the naked eye, the cysts when inflated being of an elliptical form, and having an average length of about one third of an inch.

The coil of the enclosed worm was nearly globular, with an average diameter of about one tenth of an inch.

* [These elliptical bodies are composed in most part of carbonate of lime, and would appear to be intended more for the purpose of giving greater firmness or solidity to the part of the entozoon in which they occur than for any other function.—*Editor's Microscopical Journal.*]

In the slightly "measled" pork the size of the worm was often less than in the "badly measled," but in every case the *Cysticercus* seemed to have reached the same degree of organic growth, and in none of specimens, "healthy" or otherwise, could I detect the slightest trace of the animal in an earlier stage of development. Had the eggs, or young animals, existed, they could not have escaped my notice. In the specimens marked "healthy" there was no trace whatever of the *Cysticercus*.

The muscular tissues at a little distance from the cysts did not present distinct alteration in their normal and healthy character, but in the immediate neighborhood of the cysts there were evident traces of the altered or diseased condition of muscle known to physiologists under the name of "*fatty degeneration.*" Where the "measles" are numerous, *fatty degeneration* would be proportionally great in comparison with the amount of healthy muscle.

In the salted specimen the cysts were empty of fluid, and the "assimilating cellules" in the body of the worm had become somewhat opaque, presenting a central granular nucleus instead of the clear transparent appearance noticed in the fresh specimens I conclude from this that the life of the *Cysticercus* is destroyed by the process of "*curing.*" Fig. 7 shows the appearance of the assimilating cellules in the *fresh*, and fig. 8 in the cured specimens.

It is maintained by the most eminent physiologists of the present day, that the *Cysticercus* of the pig is the "scolex," that is, the intermediate or arrested condition of the "*Tænia solium*," or tape-worm of man and other mammalia.

The organization of the *Cysticercus*, as above described, goes far to establish this opinion, and direct experiments instituted upon dogs and other quadrupeds fed upon fresh "measled" pork seems to place it beyond a doubt.

In the present case there was neither time nor opportunity to verify by direct experiment.

The history of the early condition and future development of the *Cysticercus*, the pathological and hygienic deductions to be drawn from the above observations, and their bearing upon the wholesomeness or otherwise of fresh, cured, or cooked "measled" pork are questions which appertained to the branch of the inquiry entrusted to my colleagues; I may, however, observe, that the microscopical examination here detailed would lead to the conclusion that the presence of the *Cysticercus* in the numbers which occur in "slightly measled" pork does not appreciably affect the healthy condition of the muscular fibre, and that it is only when the numbers of this parasite are considerable that the degeneration and watery condition of the muscles become apparent; and as it further appears that the operations of curing, or cooking, destroy the assimilating powers of the cellules, and consequently the life of the *Cysticercus*, it would seem that no apprehension need be entertained of tape-worm following the use of "measled" pork provided the flesh be carefully cured or thoroughly cooked.—*Veterinarian.*

Never refuse instruction.

Talk About Sheep.

"Our best mutton now comes from Kentucky," was the reply of a seller in Quincy Hall Market, in Boston, to our inquiry during the last November, as to the supply of Boston market with meats. The English steamers bring across the ocean, we are informed, a portion of the mutton served up in the fashionable hotels in New York. It is notorious, that while in England, mutton furnishes a large proportion of the animal food of those who are fortunate enough to see meat upon their tables; in America, where we fancy nobody is too poor to be abundantly supplied with the best of food, there are large sections of the country given over to "hog and hominy"—where a mutton-chop or roast leg of mutton is unknown, and even Beacon Hill in Boston, cannot spread her elegant and hospitable table, without a contribution from the rich pastures of Old Kentucky. The yankee notion seems to be that sheep were made to bear wool, but all through New England, where the farms are old, and the land is comparatively poor, of late the opinion is gaining ground that it may be profitable to copy our mother England, and give more attention to producing sheep that may yield the double crop of food and clothing.

Great Britain is the model agricultural country in the world, producing now an average crop of twenty-eight bushels of wheat to the acre, while the average crop of the United States, by the census of 1850, was but nine and one-eighth bushels to the acre, and the average crop of France, naturally a better wheat country than England, is estimated at thirteen and a half bushels to the acre. Sheep-husbandry is the foundation of British agriculture. Mr. Webster returned from England impressed with this fact, and, both in public and in private, advocated something like their sheep and turnip system for our country.

England proper, with an area something less than that of Virginia, is supposed to contain forty-five millions of sheep, producing annually two hundred and fifty million pounds of wool. In a pretty thorough examination of English agriculture in 1857, we did not see the flock of Saxony or Merino sheep, or of any breed which with us would be reckoned fine woolled. We attended several county shows of animals, as well as the exhibition of the Royal Agricultural Society, and found the sheep-pens filled only with animals of the coarser grades. It is an interesting inquiry why the coarse woolled sheep should alone be found profitable in England, while in America attention is given almost exclusively to the fine wools. There is, however, no great mystery in the matter. Thus far, America has pursued the only course possible for her, but it is at least doubtful, whether, in many parts of her wide domain, the time has not come for a change in her policy, by the adoption of breeds with reference, in part at least, to the production of meat.

We are fully aware of the difficulties of discussing this subject in a journal having a circulation as well in the cold North, and long settled New England states, as in the fertile prairie regions of the West, and in the milder of the

South, yet there are general principles which eventually must control the whole matter, and some of these it is my purpose to discuss. It is obvious that where the market is remote, and where feed is abundant, as in Texas, and the new states of the West, and in Australia, wool must be the main object of the grower, because wool is easily stored, and light of transportation, and nice calculations as to the cost of keeping are unnecessary, while meat could find no market; and indeed the unlimited supply of pasturage at trifling or no cost, renders it for the interest of the owner of the flock to increase as rapidly as possible its numbers, and of course forbids the slaughter of any. On a given farm of limited extent, on the other hand, as in New England, where the winter is long and severe, the questions presented are nice, and of difficult solution. Here the railroad is at every man's door. The demand for meat is uniform and beyond the supply at reasonable prices. Every acre of pasturage, and every pound of hay has its market value, and the success of the farmer depends upon his converting the products of his farm eventually into cash, so as to bring him a reasonable profit for his labor and capital; and at the same time maintain the productive capacity of his farm. The practices of new settlers, who cut and burn off the primeval forests, and crop the land, year after year to exhaustion, with Indian corn and wheat, have no claim to the name of agriculture. This is only a system of plunder—a development of the resources of the soil, by taking out of it its life blood and sending it away to market.

The feeding upon the unoccupied lands of a new country, although not like these, ruinous and exhausting, is a mere pioneer operation, temporary from its nature, and not therefore to be considered, when inquiring into the merits of a permanent and self-compensating system.

We see in England a constantly improving agriculture. The land, instead of becoming exhausted, after centuries of cultivation, now yields greater crops than ever before. Instead of becoming poorer, like many American fields, so as not to produce a crop of wheat which repays the labor of a half cultivation, many English fields under modern high farming, produce forty or fifty bushels of wheat to the acre, and are cropped contrary to the general principles of their husbandry, with two white crops in succession, because they are actually too rich. It is a complaint with the brewers that the best farmers produce a crop of barley too heavy, per acre, to be best suited for malting purposes.

Sheep husbandry, as has been said, is the basis of the English agriculture. It not only sustains the farm in increasing fertility, and renders it productive of crops to be sold, such as wheat and barley, but returns a profit of itself.

The farmers with whom we conversed, uniformly declared that they considered it a satisfactory result, in stall-feeding bullocks, if the increased value of the animals paid the actual cost of their food, the manure being all they expected to gain; while all seemed to agree that the sheep leaves them a profit in wool and flesh in addition to the expense of keeping.

That it may be clearly seen how conspicuous a character the sheep has become in

British husbandry, a brief sketch of the general system of the agriculture of that country is essential. The old four-course or four-shift system of England had its origin in Norfolk County, but has spread over the whole country, modified indeed by circumstances, but still remaining the basis of English husbandry. The lands of England, it will be borne in mind, are not usually owned by those who cultivate them, but are leased by the large proprietors, in farms varying from one hundred to one thousand or more acres each to the farmers, who are often men of large capital, and of good education and training for the business.

Holding either by written leases, or by customs equally definite and obligatory, the farmers are bound to a systematic course, usually very similar, over a county or wide district of country.

The regular four-course system divides the arable land into four divisions nearly equal, cultivated alternately with turnips, barley, "seeds" and wheat. The third crop, which they call "seeds," is a crop for green fodder, usually clover, rye-grass, or vetches, called also tares. This system provides, it may be observed, for two white crops, barley and wheat, which are sold, and two green crops, turnips and seeds, which are consumed upon the land The great problem of husbandry is, to consume enough upon the farm to preserve its fertility, and at the same time, to sell enough of its produce to pay a fair rent and the cost of labor, tools and other expenses of maintaining the farm and the occupant with his family.

We had intended to sketch in a few lines, the common four-course system of England, but find that it cannot be summarily disposed of. Without a clear idea of this system, the management of sheep in that country cannot be at all understood; and we will therefore in a future number describe the course of this husbandry, with sufficient minuteness to render manifest the importance of the sheep, and show how that humble animal is made not only to support herself but the farmer and farm. If we cannot adopt their management in full, we surely may gain many useful hints of practical value, and combining what is valuable from abroad, with what has been learned at home, we may create a system adapted to the various and varying wants of our country, so diversified in soil and climate, yet nearly all of it adapted to sheep husbandry.—*American Stock Journal.*

BELLE CLARKE was reading of some men starting into the field "with their hoes on their shoulders." But, being a city girl, and better acquainted with another use of the word, she thought it were "the last place where she would think of carrying *her stockings.*"

Two old ladies, who we knew to be of the same age, had the same desire to keep the real number concealed; one, therefore, used always upon a New Year's day to go to the other, and say, "Madam, I have come to know how old we are to be this year."

For the Southern Planter.

The Culture and Management of Tobacco.

[*A Premium Essay.*]

Tobacco has for some years past engrossed the attention of a large portion of the agricultural community of this State and North Carolina. The counties of Henry and Pittsylvania, and some parts of a few other counties in this State, and Caswell and Rockingham in North Carolina, have far surpassed any section of the United States in the producing of an extra fine manufacturing article; and although it must be confessed that the lands of this section are better adapted to the production of this commodity, yet we have seen lands suited well for making fine tobacco where only a very common article was produced. Believing, therefore, that a great deal depends on the management, and that the finest crop on the hill may be butchered and ruined by bad management, we will in this article give such directions as are backed by practical experience, and will venture to assert that no manager of the weed will lose anything by following the path here laid out before him. First, then, we will begin with

Cf. Essay in Southern Cultivator - So. Pl. 1857, p. 289.

THE KINDS OF TOBACCO.

We have no hesitation in asserting that there is a very great difference in crops, managed in the same way, arising from the different kinds of tobacco planted.

The two kinds most used in this section are the broad and narrow leaf Oronoco. The latter, though rather an uncertain crop, owing to its liability to spot, is of by far the finest texture, and will ripen at least two weeks sooner than any other article grown in this section. It is liable to the objection of being rather small for wrapping, and when planted on very rich land will, if the season is at all wet, be almost certain to fire up; but planted on moderate new land, or kind grey old land, it will produce a finer and sweeter article than any other kind. It is very heavy, and will outweigh a larger plant of the other kinds.

The broad leaf is very desirable for wrapping, and when not too large will make a very pretty article, but its texture is decidedly coarser than the other, even on the same land. The leaf is thinner, the veins coarser, and it is to a certain degree lacking of that oily richness which the narrow leaf possesses. It is much less liable to spot, and therefore can be grown on stronger land. The other kinds, we think, are about equal in all respects; while some possess one desirable quality, they also possess many objectionable ones. There is a kind now greatly used in our county which seems to be a mixture of the broad and narrow leaf Oronoco, which is very desirable, and our experience is that it should be cultivated, for it loses many of the objections of both by the mixture; and while it loses some of the good qualities, it is, upon the whole, a very fine kind of tobacco. It will be observed by what has been said, that neither this nor the narrow-leaf proper, is fit for any other than a fine manufacturing article.

SAVING SEED.

The earliest and most promising plants should be turned out for seed. These should be pruned of everything exeept the large leaves, and only the two topmost branches left to bloom.

The plant should be carefully suckered as the rest of the tobacco, and about the first of October every pod, not thoroughly ripe should be plucked off and the seed cut off and put in a dry place to cure. When dry they should be rubbed out and sifted, and put up in some dry vessel, such as a dry gourd, and kept where no dampness can get to them. Seed preserved in this way will keep ten years.

SELECTION AND PREPARATION OF PLANT-LAND.

We prefer a gentle slope, with a southern or south-eastern exposure, a rich grey soil, remote from any field or other opening if it is possible. We never yet have known any other land absolutely certain for plants. While some years plant-beds in the field may turn out well; yet the utmost precaution, other years, will not be sufficient to keep the insects from devouring them. While, if the beds are in the woods, they are very rarely found by the fly, and scarcely ever injured to any great extent. We never knew a bed in the woods, properly selected and properly managed, to fail. We have seen some land in second growth of pine to produce plants admirably, and as far as our experience goes, some of the very best is this kind of land. But a bed in an open field is never certain. This is the conclusion of years of practical experience, which, to us, is worth all the slip-shod theory ever published.

Avoid land that is too wet, for on it your plants, though they *may* eventually come, will very generally be too tall, and a hill-side be damp enough, if it is in the woods, and the plants will be at least three weeks earlier. Red land, no matter how rich, is uncertain, and should be avoided.

After a piece of land has been found, select a dry time, from the 1st December to the 1st February—the sooner the better—and after raking off the leaves lay down skids about three inches in diameter and about three feet apart, across which lay down a bed of wood five or six feet wide, and high enough to burn about an hour and a half, and then leave a sufficient quantity to move, so that there will be no difficulty in kindling after the first time. When it has burned enough, move the fire about as far as the width of the first layer, then throw on brush and a good bed of wood, and so on. Brush adds greatly to the burning of the fire, and must be used with every layer. Every farmer ought to provide himself with iron hooks for pulling plant-bed fires. There may be such a thing as burning land too hard, but we give it as our opinion that where one bed is injured by hard burning, ten are injured for the want of it. We have heard a great deal about raising plants with guano, and without burning, but in every case we have witnessed it proved a signal failure, if the spring was at all a dry one. We have seen the most carefully prepared bed without burning, by the side of well burnt beds, and receiving double the attention of the other, prove worthless,

while the burnt beds were good. Therefore, we advise, with the present lights, that no one shall leave the old way so far as to miss a crop of tobacco for want of plants.

We think, that for every ten thousand hills to be planted, there ought to be at least ten yards sqare of plant-land. A bed ten yards square will plant more than ten thousand, if it is good; but it is much better to have some for your neighbor than to be under the necessity of begging plants.

After the land has been well burnt, it should be allowed to lay until the first or second week in February, so that the rains and frosts may have the effect of pulverizing the land as much as possible; then, with mallock, dig up the land so as not to turn it over at all; and, with hilling-hoes and rakes pulverize the land thoroughly, remove all the roots, and if the land is thin, sprinkle a light coat of stable manure, (clear of grass seed,) and chop it in and rake again, and the bed is ready for sowing.

We think a large table spoonful of seed to the ten yards square is full enough. The seed should be carefully mixed with nice sifted ashes, about half the seed sown over one way and the other half sown by walking across the first sowing. By this the seed will be more regularly sown. After the seed are sown, the land should be lightly raked and rolled or trodden until it is smooth—and now is the time to manure. Along in the fall there should be some stalls in the stable cleaned out, and the horses kept in them should be fed exclusively on corn and fodder, and no litter of any kind be put in. The manure from the horses should be suffered to collect and remain until you wish it for plant beds. It should then be chopped fine and sprinkled a little more than half an inch thick regularly over the beds. This manure should not be suffered to get wet until it is used. This should be the last manuring, unless the spring is very dry, then a light top-dressing once a week would be beneficial. As to the use of guano on plant beds, we are not prepared to recommend it as highly as stable manure. It has never acted for us as well, and we see no use in trying it, when we can so easily get a better article out of our stables. We like to try experiments, but do not think it safe to venture too far from the good old way, until experience has taught us the new way is better. We have known men, sensible in all other matters, to trust their whole crops to unburnt guano beds, and have uniformly known that they were plant-beggars, and very considerably cooled in their zeal against old fogyism.

We will add, that in the absence of stable manure, a light top-dressing of plaster will be of service; but if you have good stable manure "let well enough alone," for if the direction as to land and management be followed, there is about as much chance to fail in plants as there is to fail to go to sleep at night after burning land hard all day.

About the 1st of March the beds should be re-trod and carefully covered with straight fine twig-brush. Dogwood is the best brush, owing to the fineness and thickness of its twigs.

The brush should never be removed until the plants are large enough to pretty well cover the land. There are few circumstances under which a plant-bed, in the right locality, well burnt and manured, should be watered. We are disposed to think that watering is generally a disadvantage, unless the spring is very dry.

PREPARATION OF NEW LAND.

The first thing is to take up every growth not too large to grub, and throw these in heaps, then cut the smaller trees, the brush of which throw on the grub-heaps, and then the larger timber. The brush of a new ground should, if possible, be carried to gullies and galls; but, if this cannot be done, the old way of burning, though objectionable, is the only alternative. After the ground has been raked and cleaned off, it should be coultered at least three times, which, if well done, will be sufficient; then laid off and hilled. The hilling is very important, for a plough in new land will not prepare it right, and "whatever is worth doing is worth doing well." The manuring of new land, though troublesome, pays well. We would always recommend for it to be applied in the hill, if the land is rough, as broadcast will waste a great deal of manure the first year. It may be broadcast the second year. Thin ridge-land will produce a beautiful crop with a table-spoonful of guano to the hill. The second year it may be manured as other land, for if the first year's work is done well, it will be prepared to receive manure broadcast. The hilling of new land may be done at any time after March.

OLD LAND.

It is useless to think of making a fine article of tobacco, with manure, on stiff, red land, for though it may be strong enough, it will be too slow in the first place; and in the next, it will grow the plant, as the negroes say, of a "greasy green" colour, and though it may be cured, with very great patience and labour, of a tolerable colour, yet it will not be fine. A grey, gravelly soil, with manure, will make a fine article of tobacco, if the manure is properly applied. On common corn land, the application of two hundred pounds of good Peruvin guano, to the acre, will insure a fine crop, applied broadcast, but if the present crop is the object, it may be made by half that amount applied in the hill. We have succeeded well by the application of guano in drills. After the land has been thoroughly ploughed, lay it off in rows, three feet apart, and in these rows strew the manure, and with a small one-horse turn-plough, make beds on the rows, so that the manure shall be immediately under the bed, and then hill the land nicely. We think all upland ought to be hilled. About one hundred and twenty pounds guano will be enough to the acre when drilled.

CULTIVATION.

The main secret in this, is to keep the land clean and well stirred. In new land this may be done by two good workings in the proper time. If the land is freshly hilled, about two weeks after planting the hills should be scraped down and a little fresh earth put to each plant; about three weeks after this it should

be hilled up, and in ordinary cases this will be sufficient, except to keep down the sprouts that may put up. Tobacco ought not to be worked after topping, as it will break the leaves, beside making it too late. If the crop be planted in right time, (say from the 20th May to the 5th June,) it ought to be "laid by" certainly by the 1st of August. Ploughing smooth, new land once (at the last working) is of service, but if it be rough and stumpy, keep a plough out of it altogether.

CULTIVATION OF OLD LAND.

Old land should be planted as early as the 20th May, if possible. It requires more work than new land. As soon as the plant gets sufficient hold, it should be ploughed and worked with hoes, and should never be allowed to remain more than two weeks without working until it gets in the top, and the work every time should be well done. 10th of May. Maj. R. L. Page.

TOPPING.

This should begin as soon as there is a sufficiency of plants large enough to make a respectable topping. In an early crop, large plants may be topped to ten and twelve leaves, from about the 20th of July to the 1st of August; but after that time no plant should be topped to more than eight leaves, to make fine tobacco. The priming should be according to the plant, but never too high. As a general rule. four or five of the bottom leaves should be pruned off. We have no faith in topping tobacco to fifteen and twenty leaves, with the expectation of making a fine article. It will invariably be too thin, and though it may be cured yellow, it will be wanting in strength and sweetness. The low leaves will never ripen with the top ones. In many sections of the State, the very mistaken idea prevails, that all yellow tobacco is necessarily fine. It is known to all good tobacco makers, that a half-ripe plant is as easily cured yellow as a fully ripe one, and it is also known that its the meanest chewing tobacco that ever was made. By high topping a yellow crop may be made, but a fine one, never. It is like the Irishman's persimmon, "it is pretty to look at, but, *faith*, 'tis bod to the taste."

Tobacco topped to just so many leaves as that each leaf may get fully ripe, and when cured, of a rich yellow colour, possesses beauty, sweetness and flavour. It will please the sight, the smell, and best of all, it will give entire satisfaction to the chewer. It is also a very mistaken notion that fine tobacco can be made on rich bottom land by topping high. If you wish to make fine tobacco, do not plant land rich enough for shipping tobacco. A crop that will average less than six plants to the pound is too large for manufacturing purposes.

SUCKERING AND WORMING.

This should be done at least once a week, and if the worms are numerous, twice would not be too often. The process is understood by every man that ever made a plant of tobacco, and all that is necessary to say is, to do it well. Destroy

every egg than can be found, and send the little negroes to the Jamestown-weed patch every evening, about sunset, to kill tobacco flies. Cobalt effective. See p. 231.

CUTTING.

By the middle of September, if your crop has been planted early, it will be fit for cutting. Never cut immediately after a rain, if you can possibly help it. We will give several modes of cutting: First, if the weather is settled, commence about two hours before sunset, and cut until night. It will not fall at all until the sun breaks out next morning. As soon as the sun has limbered it just enough to handle, pick it up and put in heaps, or stacks, as they are called, beginning with a handful of ten or twelve plants, set with the stalk as straight up as they can be made to stand, and the leaves slightly tucked on the ground. Then, with other handfuls, set around so that each handful shall bear its own weight. When all the tobacco near the spot is set up in this way, have the stack covered with bushes, so that the sun cannot burn the out-side, and as soon as it is all packed up, have it hauled to the barn-door and scaffolded.

If the cutting is put off 'till morning, manage in the same way, and always be sure not to let it get too limber; for it is impossible to haul limber tobacco without bruising it, when too limber, and a bruise, so far as it extends, is as bad as a frost-bite. Another mode for cutting is, for two hands, each cutting two rows, and a third hand, with a tobacco stick between them, and as they cut the plant, instead of laying it down, to throw it across the stick held by the hand between them. As soon as the stick is full, it is laid carefully down, and suffered to remain until it is limber enough to move. It is then carried to the scaffold on wagons, care being taken to pack it so that it will not bruise. This is a very swift way, and will do if the barn is not too far off.

SCAFFOLDING.

This should always be done at the barn-door. The scaffold should be made with the poles pointing to the door, so that there is no necessity of walking across them. It should be made just high enough for the tails of the tobacco to touch the ground, to prevent the air from passing under, and if the weather be mild, the tobacco may be suffered to remain on the scaffold until it is sufficiently yellow for firing; but if the weather is cool and windy, the tobacco should be put in the house as soon as it is cut. Wind will disfigure the finest tobacco in a very short time, and make it look very common. After the 1st of October, it is best to house immediately.

When the weather is favourable for yellowing on the scaffold, it will generally take from three to five days, according to the colour of the plant on the hill. In the house it will take longer to yellow, and will take greater care to cure it so. But it can as certainly be cured yellow by housing from the hill as by scaffolding, but we are disposed to think that it is not so sweet as when it is suffered to yellow in the sun.

CURING.

There are only two modes by which fine manufacturing tobacco can be cured, viz: by flues, and with charcoal. We do think that to cure tobacco with chunks is a disgrace to the tobacco-making community. It has been totally abandoned in all the fine tobacco-growing sections; and as for sun-curing, we have very little faith that a pretty article can be cured in that way. The process of curing with flues is certainly more simple, a greater saving of time and labour, and of more certain success than any other known. In some sections the stone for building flues cannot be procured, and we recommend as next best, the curing with coal. With flues, we recommend, that as soon as the tobacco is yellow enough on the scaffold, that it be put in the house, the sticks about six inches apart, and if the barn is clear of dampness, and the tobacco dry, it may be cured, stalk and stem, in twenty-four hours, if the flues are properly constructed. Nothing is necessary, when all this is the case, but to heat the flues as quickly as possible. The door should be left open for the first eight or ten hours, or until the leaf begins to crook, after which no heat, short of bad scorching, can hurt the tobacco. But if the tobacco is damp and clammy; the flue damp; the floor of the barn moist, the tobacco should be put in at least thirty-six hours before it is yellow enough for hard firing, and slow drying fires be applied until the barn is dry, by which time the tobacco will be sufficiently yellow; then fire as before directed, and in no case slacken the fires, after the flues are heated, until the tobacco is thoroughly cured, stalk and stem.

If the tobacco is to be yellowed in the house, it will be best to build a small fire in the flues once a day, so as to create about Summer heat, and never more until you begin to cure. It will take a good deal of patience and care, if the weather is cool. If it is warm and pleasant, it is best not to put fire to it all until you begin to dry off. Care should be taken not to let tobacco, housed from the hill, get too yellow, for the dampness will be almost certain to turn it red. A day or two before it is yellow enough for curing it should have drying fires, not enough to cure at all, for if it commences to cure, the best plan is to keep it on, as to spot it is certain to ruin it.

Curing with coal is done by the same process. The coal will raise a heat much quicker than flues, and care must be taken not to heat the tobacco too suddenly. Flues cannot be heated too suddenly, for under the best circumstances it will take three or four hours to get them hot, and if the tobacco is right for firing, this is gradual enough.

CONSTRUCTION OF BARNS.

We believe in small barns for any kinds of curing. A house built 16 feet inside and divided into four rooms and six tier high in the body is the preferable size for flue or coal curing. For flues they should be built on a very slightly sloping place; just enough to make the flues draw well. Flues four inches lower at the eye than the chimney will be slope enough.

The door should be always between the flues and in the end of the house, to prevent the drip from falling before the door and the eye of the flues. The tiers should begin eight feet above the ground and be placed two feet above each other to the top. They should be placed across the house so that the roof tier can conveniently be placed above them. The door three feet wide and six feet high, furnished with a good close shutter. A barn of this size will cure 800 sticks of common size tobacco, which will weigh about 1200 lbs. The proper construction of the flues is of great importance; they should be built of any stone that will stand fire without bursting. White sand stone, bastard soap-stone, or any other that does not contain flint. The size of the flue, for a sixteen foot barn, is generally about 12 inches wide by 14 inches high inside. Not much care need be taken to have them smooth on the outside. If stone can be had to make the inside smooth so as not to obstruct the putting in of wood, it is all that is necessary. They should be run just far enough from the house-side not to set the house on fire, and there is not as much danger of this as may be supposed. Run the walls of the flue parallel with the house-side, turning with the corner so as to preserve the same distance from the house-side all round, running the stem out at the middle of the upper side. The stem should be run far enough above the wall of the house to avoid danger of sparks from the chimney. The height of the inside of the flue should be preserved its whole length. The width may be slightly decreased from the elbow to the chimney. The inner wall is carried all around. But too much explanation often bewilders; we think we have said enough.

As before said, we like small barns; where too much tobacco is together, it all cannot receive the heat alike, which is our main objection to large barns.

As to the number of barns necessary, we would say that there ought to be enough to receive all the crop without moving any. Say one sixteen foot barn to every 8,000 hills of tobacco planted. As a general rule, plant one thousand hills for every hundred sticks house-room. That is, if you have three barns plant 24,000 hills, and if it is common tobacco, they will receive it. A much larger quantity may be saved in this number of barns by curing and moving out, but is very troublesome.

STRIPPING AND ASSORTING.

Tobacco should be stripped when it is in tolerably high order and hung back in the barn immediately and suffered to remain until the Spring. We don't like the idea of bulking tobacco to lay all the winter. The "coming and going" is a decided advantage. Furthermore, it cannot be put down in keeping order until the Spring.

In stripping, it should be tied up in moderate size bundles not too small, and a lug leaf should always be used for tying, as the tie leaf will always mould. The assorting is somewhat important to those who prize for market, but as our tobacco is always bought at the barn by country manufacturers, and a certain price given for the crop round, we generally make only two qualities—fine and

lugs. But, where the farmer is dependent on the whim and caprice of the town tobacconist, he must try to please him.

We have often thought that a fine crop of tobacco needs very little assorting, and a mean crop needs less, for if a crop is strictly fine, there can be only two qualities made of it; if it is mean, it ought to be sold as mean tobacco, and the few fine leaves ought not to be taken away to make mean meaner. This may be thought novel reasoning, but it must go nevertheless.

ORDERING AND DELIVERING.

If you do not suffer your tobacco to hang up during the Winter, it should at least be hanging by the middle of March, so as to take the first good season thereafter for putting down. This should be done in a warm season without rain if possible. The tobacco being previously thoroughly dry, as soon as the leaf is in order enough to bulk without breaking, it should be put down on a platform made of plank two or three feet from the floor. There should be at least three hands at each bulk. One to take it from the stick, two bundles at a time, and hand it to the second, and he, after straightening, will hand to the packer, who will put it down as carefully as if he were packing it in a box or hogshead for market. After the bulk is thus made, it should be covered with plank and weighted heavily. Nothing adds more to the looks of tobacco than careful handling at this stage. It it is to be prized it will be ready for packing without further trouble. If it is to be hauled loose to the factory, it packs a great deal better in the wagon than when carelessly handled. It will also preserve its order through the whole year, even if allowed to remain in the bulk. We know but little about prizing for market. Very little of our tobacco finds its way to town market in the leaf. When it is sent, it is generally packed in boxes lightly prized for wrapping tobacco. Presuming to know but little about this department, I shall not attempt to instruct others. One thing I will say: make your tobacco fine and very soon you will have a market at home for it. A fine article will never want for buyers, while a common article will always be dull of sale, and while there is so much land in Virginia and North Carolina that will produce fine tobacco, there is little or no excuse for making a rough article. One point more, and we are done.

AMOUNT OF FORCE TO THE 1000 HILLS.

There is an old saying that ten thousand to the hand is enough, but with young active hands, at least fifteen thousand to the hand may be well managed. This will insure a crop of about two thousand pounds to the hand, which, with a moderate crop of other things, is very good work. The crops for several years past have commanded from fifteen to twenty-five dollars round Two thousand pounds at these figures will be good wages to the hand, after making enough other crops beside to support him and pay all expenses. And on our fresh lands it can be done with ease. We have cultivated as much as twenty thousand to the hand, but it is too much to manage nicely. We have now said all that time

and space will allow. We hope it may be of benefit to some, and if the prize is not awarded to it, we hope at least we have lost nothing by writing it.

SAMUEL C. SHELTON.

Irisburg, Henry County, Va.

For the Southern Planter.

The Habits of the Earth-Worm.

Being somewhat confined to the house, I shall endeavour to give an account of a well known animal. Nature exhibits wonders that surpass credulity, and yet many marvellous things are believed which are totally unfounded in fact. Among the rest, it is said of the subject of my discourse, (popularly termed the Earth-Worm,) that if it be cut in pieces, each piece will turn out a complete worm. This is not true any more than to say that the claw of a lobster, taken off, will produce another lobster. The lobster, up to a certain age, will indeed put forth another claw, and the excised claw will, for a long time, exhibit muscular irritability. Human beings, if history lies not, exhibit in their members the same muscular irritability after death, as Charlotte Corday was said to blush and frown when her head was in the hand of the executioner, who slapped the face. If a worm be cut through, in a particular part of his body, neither part can be made to survive, but if the tail part, for a considerable length, be cut off, that will exhibit muscular irritability for a long time, but ultimately perishes, while the head part will have its wound healed and seems to get on very well without the other part. But, still, many things can be related of worms sufficiently wonderful, and we shall endeavour to prove that he has really a high organization. In fact, he is the most thorough ventilator known in nature, and requires constant supplies of food, water, and, above all, fresh air. We will relate how we became familiar with the habits of worms, so that some curious investigator may pursue these researches, and verify or disprove our conjectures. Being fond of fishing and on some days being able to obtain any amount of worms, while on an emergency we often failed to obtain a sufficient supply, and being advised by old fishermen to put up a large supply of worms in meal, as they said to purge them of the grit in their bodies, rendering them more palatable to the fish, we began to speculate on the subject. We concluded that they only swallowed grit on the principle, that a hungry boy would swallow cherry and grape stones, not that he liked them, but was unwilling to take time to separate pulp from seed, and so the worm, if he could get at meal or flesh unmixed with grit, would do so. So we obtained a box, pierced the bottom with holes, so small that the worms could not escape, but that water could drain out, filled up the box with a kind of sandy clay, embedded a brick on top of the clay, put in a handful of worms and kept them supplied with meal, blood or flesh sprinkled on top of the clay, and put the whole in a place secure from all kinds of animals, keeping a good supply of water in the box. The worms soon seemed at home in their new domicile and ho-

neycombed the clay soon with their galleries. The rapid disappearance of their food testified to their appetites, and they evidently used a great deal of water. They soon became too much our pets to think of devoting them to fish, and the following observations we make on their habits. Whether the British worm is like our earth-worm, we know not. We have never seen them accurately delineated in print, and we are such an indifferent draftsman, that we cannot begin to draw one accurately.

Being a very poor naturalist, we cannot describe fully the parts o such delicate organs, as stomach, spiracles, organs of generation, ovaries, &c. We have often seen worms in such close contact, that we have concluded that impregnation takes place by a kind of pressing of the organs of generation lying in a sack under the stomach of the worm, and the semen of the male thus ejected upon the ovaries of the female, mouth to mouth. However this matter takes place, the mother worm incorporates a jelly-like substance with earth, and in this deposites the spawn which comes out alive. So abundant are these spawn in some places, that hogs will eat the earth, and probably that is the kind of earth which certain tribes of savages are said to devour. The young worms soon form innumerable galleries in this earth, almost invisible to the naked eye, feeding upon the jelly, until large enough to provide for themselves. Each worm has a system of gallaries for ventilation, and when near the surface of the earth, probably to avoid the effects of evaporation, they hide under a stone, brick, log, or any thing else partially embedded in the ground, with several galleries running outside of them to the air. How far they extend we know not, probably to running water, as we have seen worms thrown out near the bottom of a deep well. The walls of the galleries are cemented with a kind of glue from their bodies, so as to be air-tight, but not water tight. They are not exactly cylindrical, but are full of smooth cavities, so that the worm can fill them by his swelling out his body, and thus pull himself along by muscular power. No one can form an idea of the swiftness of a worm, under ground, by seeing him crawl on the earth, for he has not such cavities on the surface, as in his galleries, to fill up with his body and thus afford him a purchase by which to pull himself along. When he requires ventilation, he first rises to the surface of the earth to see that all his galleries are clear, and then commences to pump air into the cavities, as he fits the cavity precisely by shortening and enlarging his body, he pushes out the foul air before him, and then converting each end of his body alternately into a piston and piston rod, by proper motion, he can send the air along the gallery in any direction that he pleases. He then descends, drawing the air along with him. Thus his gallery has constantly a supply of fresh air drawn into it, and the foul air pumped out. In some rivers in Virginia, there is a fish which never rises from the bottom, and unless the bait is kept on it, the fish will never bite. When the fish is caught, if his stomach be opened, fresh worms will be found in it, which shows that they get a plentiful supply at the bottom of the stream. Yet a worm cannot live long under water. Neither can an otter, but both can feed

in it. The worm gets under some log at the bottom of the stream, running a gallery to the places haunted by the fish to feed, perhaps on their spawn and excrements, or dead fish; then he construets another to the bank, and thence to the air. He has a kind of cell under the log air tight, and upon the principle of a diving-bell, he pumps air into the cell under the log from the aperture in the bank, and thus furnishes himself with a supply of air; when he forages upon the fish ground and feeds, he retires to his cell to get a fresh supply of air; no doubt when seeking his food, under water, the fish eatches him.

NORBORNE BLOW.

For the Southern Planter.

Tobacco Barns.

LOUISA, February 18th, 1861.

In reply to "A Subscriber," making inquiry eoneerning the best method of building tobacco barns, I submit the following plan:

A house 24 X 44 feet; 20 feet high, will cure 10,000lbs. of tobacco, if it is large and ripe.

The house should be raised 18 inches from the ground and eellared 6 inches.

The first, or "ground tier," must be 6 feet from the floor, and a space of 3 feet from the top of 1st tier, to the top of 2nd, and so on through the house.

The perpendieular framing must be 4 X 6 inches, and 4 feet apart, the horizontal "laths" 2 X 3 inches, and let into the perpendicular "studs," at the proper distanees for the tier poles to rest on; the house to be covered with perpendicular boards, and the joints covered with strips, the strips should be omitted in the upper part of the gable ends.

The roof must project 1 foot *at both sides and ends,* for ventilation, and if covered with shingles, (as it should be,) ventilated again on the south side, near the "eomb" of the house.

A window must be left 6 *inches wide at both ends of every row of tier poles,* to be closed with an inch plank, hung with 4 butt hinges.

A house built on this plan, is perfeetly close when desired, and the reverse when air is needed. Respeetfully, &c.,

A PLANTER.

For the Southern Planter.

Fertilizers---Drilling versus Broad-Casting.

In the Planter for February, I find an enquiry from "A Farmer," as to the drill in comparison with broad-casting the same quantity of fertilizer per acre; and though I may not be able to give a single new idea in regard to either, I ean give my experience in regard to both.

Before I do this, suffer me to say that I have been impressed, frequently, with the importance of suggestions made through the "Planter," that farmers might interest and enlighten each other, by regularly eontributing, in condensed form, their *experience* in regard to a multitude of things which pass under their observation. Many have done so to their credit, and to the improvement of others.

But what a vast majority, in our State, have kept silent. Why may not these devote an hour now and then to this subject? Much of what might be written in this way would no doubt be considered by many as of small importance; but some, beyond doubt, would prove valuable. As you, Messrs. Editors, print this farming experience for nothing, of course you must exercise the right of excluding the indifferent and publishing the best.

I have heretofore held back from considerations identical, no doubt, with those which have influenced others; but as I mean now to *begin* to show my faith, in the importance of this interchange among the farmers of Virginia, by my works, I hope that many others who, like myself, have heretofore been afraid of being seen *in print*, will follow the example.

I hope "A Farmer"—for whose benefit more especially I send my first effort in agricultural *essaying* to the Planter—will pardon this digression.

For several years past I have used a drill, and, except part of a field in 1859, have always drilled Guano or Sup. Phos. of Lime (chiefly the latter) with the wheat, putting in about half my crop every year in this way, and broad-casting the remainder, both wheat and fertilizer.

I have a great liking for the drill; not so much because of any very obvious difference in the crop at harvest, all things being equal at seeding time, but for other reasons. Now, if "A Farmer" had reference in his inquiry, specially to exact difference in yield between the two methods, I cannot inform him; but if to ease and regularity in sowing fertilizers, then I may offer the following, having an eye to the *amount* of work as well as the regularity of it. You can with one hand and a pair of horses put in with a drill from six to sixteen acres a day, according to the size of the drill and character of land, depositing wheat and fertilizer with almost exact regularity. When 200 pounds or upwards of fertilizer is required to the acre, the drill, for regularity in distributing it, is far superior to any broad-casting by hand. When 100 or less to the acre is required, the drill in *very* damp weather is not so reliable; the guage has to be drawn so close, that all descriptions of fertilizer which I have used will clog. My experience is, that 100 pounds or less to the acre by hand, is very difficult to regulate, but even this small quantity in dry weather can be done nicely with the drill.

Broad-casting fertilizer by hand is both hard and dirty work. The drill avoids both. In high winds the regular distribution of fertilizer by the drill is not interrupted, indeed the accuracy is promoted thereby, because the wind dries out the fertilizer, and prevents all clogging.

Broad-casting by hand in windy weather with accuracy is simply impossible.

Wheat properly drilled is safer in the majority of winters against frost than that sown broad-cast. Then, if this be the only advantage the average yield of a given number of years must be in favor of the drill.

I do not think the drill saves anything in the quantity of wheat sown. Our stiff lands require from one and a half to two bushels per acre however sown.

Grass following fertilizers sown by the drill has, with me, done quite as well as that after broad-casting, in most cases better,—owing, no doubt, to the protection afforded the young plants by the drill furrows.

I have no experience in sub-soiling.

LIMESTONE.

Clarke County, Va., Feb. 23rd, 1861.

For the Southern Planter.

On the Importance of elevating Mechanics and Artizans to a Social Equality with other Professions.

MESSRS. EDITORS.—The improved dress of the January number of the Planter and the value of its contents, (allow me to say greater than usual,) suggest the propriety, if not the duty, of those acknowledging its benefits, to contribute a *quid pro quo*. I was formerly an occasional correspondent of the Planter, and propose resuming that post, after years of additional experience, provided my reflections are deemed worthy by you of a place in your columns. There are several subjects of peculiar interest to Virginia farmers, which, in my opinion, have not hitherto been duly considered, upon which I propose, at an early day, to submit to you some thoughts.

The excited condition of the public mind at this time, however, precludes the consideration of questions not bearing, in some degree, upon the disturbing causes of the present unhappy condition of affairs. Your extract from De Bow's Review presents vividly the humiliation of the South in this her day of trial, the necessary result of long and passive dependence upon our bitterest foes for a thousand articles, some trifling in themselves, yet necessary to our comfort, which could and ought always to have been manufactured by our own citizens. Our Southern people seem hitherto, in a great degree, to have been the victims of a fatal delusion or stupid folly regarding their own and the best interests of the country. The professions of Law and Medicine, and another not less popular and equally a profession—that of gentlemen of leisure—have chiefly been the avenues through which the sons of landed proprietors, large or small, have sought honour, wealth or distinction. Into the comparative merits of these, or the comparative degree in which they have contributed to the material interests of society, I will not now enquire.

While it must be admitted a vast improvement has taken place, more recently, and our young men are beginning to be educated with a view to the more practical interests of society, yet how little attention is even now bestowed upon mechanical pursuits by educated youths! Why is this? Is an educated man less a gentleman or less refined in his tastes because of mechanical occupation? Is he less entitled to consideration and respect because he is the ingenious manufacturer of wares which are indispensable to the ordinary comfort of both rich and poor? Is the cunning architect of the stupendous locomotive, carrying progression and civilization in its train, of minor consequence in comparison with the briefless advocate or the village doctor? Or what claims to precedence

has the retail vendor of dimity and tape over him, whose skill and science in his humble vocation, shapes our vestments to adorn the person or hide the deformities of nature? These are pertinent enquiries, Messrs. Editors, and their force must be admitted, however inveterate our prejudices. The truth is, our public mind is diseased on this subject; there exists a moral delinquency which must be reformed; we must learn to appreciate and to honour intelligent usefulness, to co-operate with and sustain it, if we would be released from a degrading dependence on those who despise us, for nearly every necessary article—from the brush of the toilet to the tacks in our boots. This absurd sentiment has driven from our midst in the past half century an army of youth, whose talent and enterprize if fostered at home by an enlightened and patriotic public sentiment, would by this day have placed Virginia in a position of material wealth and independence as unrivaled as that she has ever occupied for patriotism and devotion to principle.

But, sirs, it is useless to discuss this subject further; action is what we want —immediate action, as well on this as on others of vastly more importance at this particular crisis, and we may tremble for the consequences if it is not had. It is in our power to force into existence amongst us manufactures of almost every indispensable article, by united and concentrated patronage, and others will speedily follow. The progress of our woollen factories in the last twelve months is proof of the declaration. By a firm and determined policy in socially elevating the followers of mechanic arts and bestowing merited honour on industry and talent, the South can in a few years sever its degrading and chafing bands, and feel secure in its dependance on its own work shops.

Upon whom, than the farmers, can the patriotic duty be devolved with more propriety of inaugurating a new order of things? A few years since, and even now to some extent, we get from Baltimore, and cities even farther North, much of our agricultural machinery. Is there any substantial reason for this course? Is it a wise policy on our part, or just to our mechanics? We have amongst us native mechanics—men to the manor born—who will compare most favourably with any upon the continent in intelligence, patriotism and fidelity; who work up native materials, and faithfully contribute their quotas to the national wealth. At Somerset in Orange county you have A. P. Routt and at Gordonsville, Fishback & Moyers—faithful, intelligent and enterprizing gentlemen, who understand their business, and are always prepared to supply you with any implement, from the simple coulter to the threshing machine of the highest capacity, and of the best material. The improvements and perhaps inventions of the former fairly constitute him a benefactor of the farming community. As efficient and labour-saving implements, his Drain-Plow, Iron Double Shovel, and Tobacco Cultivator, need only to be used to be appreciated.

These are the men, our own citizens, whom duty and patriotism require should be patronized. It is the talent and enterprize of these and such as these, that must be relied on to expel from amongst us the thousand cheats palmed upon

us by the Yankees in the form of painted wares and chip-soles. When correct views are cherished on the subject of our independence, and men shall fall into those pursuits for which nature designed and fitted them, with the assurance of domestic patronage and future competency, the period will not be remote when we shall be liberated and disenthralled from a worse than colonial vassalage; and industry and enterprize shall pervade our land, shedding contentment and prosperity throughout our borders.

PIEDMONT.

From the Working Farmer.

The Tomato—Its Uses and its Cultivation.

The following letter on this subject will be read with interest by all who have contemplated the influence which the universal cultivation of the Tomato is destined to have upon public health and economy. Probably few persons have bestowed more attention on the Tomato, than the writer of the subjoined letter. [ED. FAR.

Dear Sir:—Since you and many other cultivators of the Tomato have expressed your surprise and satisfaction on examining some of my Seedling Tomatos, and a desire to know their origin and proper treatment, I will, with pleasure, comply with your request.

Until within a few years, very little was known in this country about the TOMATO. It was grown as an embellishment in some corner of a flower garden, and called the *Love Apple.* Now, it is an article of daily food; and in a few years it will be in common use in almost every part of the globe. Its culture and use will everywhere extend just in proportion as reliable and exact information on the subject is spread. It does not take long now to scatter facts. The human race is coming near together, and all facts concerning our common welfare should be freely disseminated. I have grown the Tomato, and watched its culture in many of the climates and countries of Europe and America, and I will furnish my little quota of observation and practical experience, hoping thereby to draw out valuable information from others. Everybody knows something of the value of the Tomato as a fruit, and how we should miss it if it could be raised no more. But very few persons know how easily and abundantly it can be grown in perfection, how cheaply it can be preserved for future use in many forms, nor its invaluable medical properties as conducive to health and vitality. I will speak only on two or three of these points.

1st. *The best Kinds and Varieties.*—Six years ago I began a more thorough system of experiments than I had ever practised or seen. I prepared my beds for growing Tomatoes, and the analysis of the soil corresponded very closely with the chemical components of the fruit. I then germinated ten or twelve of the finest varieties I had, or could get, and obtained large, vigorous plants of the same kinds from our New York gardens. One of each was planted by itself, where it

could not hybridize. In another bed *I planted all the varieties together, to make them hybridize, and multiply new kinds.*

I succeeded in getting one variety, which I found superior to any I had seen, in the following qualities—(1) *delicacy of flavor, thinness and smoothness of skin, fewness of seeds, solidity of meat, earliness of ripening, richness of color, evenness of size,* and *ease of culture.* The next year I cast all other varieties away, and brought this to perfection; and it has been universally pronounced by Agricultural Fairs, Farmer's clubs, and Scientific Horticulturists, to be superior to any other.

2d. *My Mode of Culture.*—Germinate in a hot-house, hot-bed or kitchen; for *very early* fruit, transplant when quite small into pots. The Tomato improves by every transplanting, and each time should be set deeper. From the time four or six leaves appear, pinch or cut off the larger lower leaves and the terminal buds, and continue this process of pruning, till the fruit is far advanced; so that when ripe, the bed will seem to be covered by one mass of large, smooth, even sized Tomatoes, of the richest pomegranate color—and the leaves hidden by the fruit.

Set plants three or four feet apart, in the warmest spot you have, and let them fall over to the Northern frames twelve or fifteen inches high; or on pea brush; anything to sustain them; and keep the fruit from touching the ground, which delays ripening, creates mould, invites cut-worms, and always gives the Tomato an earthy taste. Try for only one cluster, (the first that blossoms,) and cut everything else gradually away. This will give you Tomatoes in perfection in the latitude of Buffalo, four or six weeks earlier than they are usually ripened in our climate. If you wish *late* Tomatoes, pull up each plant by the root (just before the frost comes) and hang them up on the south side of a building, top down, with a blanket to roll up in the day and let fall in the night. When ice makes, hang them up in any room that does not freeze, or in a dry cellar, and you will have fresh Tomatoes all winter—somewhat shrivelled, but of fine flavor.

Having thus brought this Tomato to comparative perfection, I wish to have the seed scattered as widely as possible. This last season I saved, with great care, some of the seed from the most perfect fruit in my garden, and I have left it with Mr. Charles V. Mapes, (at his Agricultural Warerooms in Nassau street, New York,) to whom any communication on this subject may be addressed.

Most respectfully, C. Edwards Lester.

Summer Pinching.—By a judicious pinching in of the terminal buds of growing trees, in itself an art that can only be acquired by practice, almost any tree or shrub, if taken in season, can be made to assume almost any form desired. The beautiful pyramidal pear trees of nearly all foreign gardens, as well as other dwarf fruit trees, broad at the base and gradually tapering to a point at top, is the result of a systematic, summer pinching in.

From Hunt's Merchants' Magazine.

Statistics of Population, &c.

UNITED STATES CENSUS FOR 1860.

The returns furnished by the Census Bureau to the Governors of States for the purpose of apportioning members of Congress, give the following aggregates:

NORTHERN STATES.

	Population. 1850.	Population. 1860.	Apportionment. New.	Apportionment. Old.
Maine,	583.169	619,958	5	6
New Hampshire,	317,976	326,072	3	3
Vermont,	314,129	315,827	3	3
Massachusetts,	994,514	1,231,494	10	11
Rhode Island,	147,545	174,621	1	2
Connecticut,	370,792	460.670	4	4
New York,	3,097.394	3.851,563	30	33
Pennsylvania,	2,311,786	2,916.018	23	25
New Jersey,	489,555	676 034	5	5
Ohio,	1,980.427	2,377.917	19	21
Indiana,	988,416	1,350,802	11	11
Illinois,	851.470	1,691,233	13	9
Michigan,	397,654	754,291	6	4
Wisconsin,	305,391	768,485	6	4
Iowa,	192,214	682,000	5	2
Minnesota,	6,077	172,793	1	1
Oregon,	13,294	52,566	1	1
California,	92,597	384,770	3	2
Kansas,	.....	143,645	1	1
Total,	13,454,169	18.950,759	150	149

SOUTHERN STATES.

	Population in 1850. Free.	Slave.	Total.	Population in 1860. Free.	Slave.	Total.	Appor'nt. N.	O.
Delaware,	89,242	2,290	91,532	110,548	1,805	112,353	1	1
Maryland,	492,666	90,368	583,034	646,183	85,382	731,565	6	6
Virginia,	949,133	472,528	1,421,661	1,097,373	495,8 .6	1,593.199	11	13
North Carolina,	580,491	288.548	869.039	679,965	328.377	1,008,342	7	8
South Carolina,	283.523	384,984	668,507	308.186	407.185	715,371	4	6
Georgia,	524,503	381,682	906,185	515,336	467.400	1,082,736	7	8
Florida,	48,135	39,309	87,455	81.885	68.800	145,685	1	1
Alabama,	428,779	342,892	771,623	520.444	435,473	955,917	6	7
Mississippi,	296,648	309.878	606,526	407.051	479,607	886,658	5	4
Louisiana,	272.953	244.809	517,762	354.245	312.186	666,431	4	4
Arkansas,	162,797	47.100	209,897	331,710	*109,065	440,775	3	2
Texas,	154,431	58.161	212.592	416,000	184,956	600,956	4	2
Tennessee,	763.154	239.460	1,002.717	859.528	287,112	1,146,640	8	10
Kentucky,	771,424	210.981	982,405	920,077	225,490	1,201.214	8	10
Missouri,	594,622	87,422	682,044	1,085,595	115.619	1,145.567	9	7
Dis. of Columbia,	48,000	3,687	51,687	.....	.....	75,321	..	..
Total,	6,470,506	3,204,099	9,664,650	8,434,126	3,999,283	12,508,730	84	89

TERRITORIES.

Nebraska,	. ....	28.893
New Mexico,	61,547	93,024
Utah,	11,354	50,000
Dacotah,	. ....	4,839
Washington,	.....	11,624
Total Territories,	72,901	188,370
Total United States,	23.191,871	31,647,859

Oxen, Horses, and Mules.

The consideration of the relative advantages of the different teams named above, when used for draft purposes, is of great importance to the agriculturist; for heavy loads for short distances, oxen may be used on roads with profit, as their great weight enables them to move corresponding quantities, if not required to carry them for too great a distance, where the return trip without loads would consume much time from their slow gait. In sub-soil plowing, oxen alone can be used with the highest profit; their steady pull together, with their immense force as compared with horses, render them peculiarly suited to this kind of use, and when those of quicker motion, such as the Devons, can be procured, they are invaluable for drawing the breaking plow, the sub-soil plow or soil lifter, when used in the making of drains; indeed, no team can be used for sub-soiling or in the making of drains, requiring a whiffletree, as the latter in resting upon the furrow slice or ditch bank, will prevent the descent of the plow. With oxen, by the use of a long yoke, the sub-soil lifter, attached to a chain on which is hung a weight immediately in front of the plow-beam, to secure the parallel position of the beam with the bottom of the ditch, becomes a horizontal pick, disturbing two inches or more at a time, of even the most compact soil, and thus permitting its being thrown from the ditch by long shovels, etc. In sub-soil plowing the same effects in degree prevail; the chain permits the lower side of the bottom of the beam to sink into the bottom of the surface-plow furrow, and thus enables the sub-soil lifter to penetrate the sub-soil to the greatest depth. Oxen do not start sudenly, and they move with a steady gait; and, although not so quick as the horse or mule, they are capable of giving greater intensity of force by this loss of speed.

The yoke and narrow bows impinging on the oxe's breast, occupy so narrow a space, as to materially annoy them and abridge their entire weight to the draft. We have lately made the experiment of using for our oxen a very large collar, with a broad face, so as to rest over a large surface, * * * * * * * * * and doing away with the heavy yoke; the collars are split at the top and there buckled, so that they may be easily put on and taken off. To this collar is attached a set of traces, supported by loops hung from a saddle and attached to whiffletrees, thus permitting the oxen to act independently of each other, each drawing as with the ordinary method of harnessing horses. Under such arragement, the oxen throw their heads about, and exhibit a vivacity never found in oxen wearing the inhuman yoke. They draw a much heavier load, and with less annoyance, nor do they lean away from the centre, calling on each other for support, as when yoked; they perform a larger amount of labor in a less space of time; indeed, they become a lively and good road team for the transportation of heavy loads. The age of the ox does not interfere with his weight and consequent strength. When too old to continue his service as a draft animal, he may be suddenly fattened, and will then give better beef than

if he had not been previously worked; his value is always increased, and he meets a market never to be over-stocked.

Horses are so well understood that it is scarcely necessary to recapitulate any of their advantages. For rapid work, loads, etc., they are inestimable, and their superior speed renders them great favorites, hence the term "noble animal," etc, has been applied; although it should not be forgotten, in estimating the value of horses for the transportation of heavy loads, that no animal can give a propelling force superior to his own weight. The difference in animals, in this particular, is entirely due to their ability to exercise greater intensity of action for a time, in place of a more divided and continued force; for this purpose the horse is very superior. When we require greater speed with lighter loads, the horse far surpasses the ox, while for intense action for short distances, the ox is very superior.

Mules have many advantages over the horse; they cost one-third less for feed and other expenses. They are not subject to many of the diseases of the horse, have much greater power of endurance, live to greater age, without depreciation in value. We now have a mule at our place sixty years of age, and perfectly active.

The charge of stubbornness so often made against the mule, is entirely due to the fact that he is generally more roughly used than the horse, and has a capacity to know it. When mules are as well cared for as horses, they are equally kind. They will stand greater degrees of heat and cold than the horse, and are more intelligent, that is, capable of being more readily taught. The mule has one fault; if he is left in the stable six weeks without use, he requires to be broken again. His memory is not equal to that of the horse, although his immediate intelligence is greater. He may be sustained on coarser food, with less expense for harness, shoeing, etc. No one ever asks the age of a mule, for they seem equally valuable at any age. Dickens tells us, "that sailors with white top boots, and dead mules, are never seen."

The ordinary cost of a fine mule is much greater than that of a good farm horse, but this is soon compensated for, in the difference of cost of the keep. It is difficult to understand why mules, so intelligent in comprehending new kinds of service, should be so deficient in some other respects; for if a mule be bedded with the commonest salt hay, and his manger filled with good oats, underlaid with a half peck of thistles, he will probably eat the thistles first, his bedding next, and the oats afterwards, unless intermediately he should take a notion to feed on his crib or the side planking of his stall.

A mule may be taught to drag a carrot weeder, No. 0. lifting sub-soil plow, or a horse hoe, through rows of every width. At a late visit of a committee of the American Institute to our place the mule *Kitty*, sixty years old, carried a sub soil lifter through rows of celery plants, planted twelve inches apart, which by their growth had reduced the space to eight inches, without treading on a single plant; she moved her feet parallel with the ground beneath the plants and close

to the surface of the ground, placing each in front of the other without difficulty. The mode of drilling a mule to perform this operation, is by placing two joists, twelve feet long and four inches in diameter, on the ground at three feet apart, early in spring, driving the mule through the joists, without reins and by the word, twenty or thirty times; then turn over one joist toward the other, thus bringing them four inches nearer together, and drive the mule through again twenty times, practicing the short turning by word; then move the joist four inches again and so on until they are quite near together. If the animal should tread on one of these joists, it will turn inward and trip it up. When the mule is again on its feet it will tremble with fear; then place the joist one inch wider apart than the width of either of its feet, and the mule should be then walked through between the joist, thirty, forty, or fifty times, this it will do by placing the right and left feet alternately before each other, occupying but one line of space. If kept actively employed thereafter, it will be found capable of duplicating this action between row crops, carrying either the No. 0. sub-soil lifter, the carrot weeder, or the horse hoe, and doing the work of forty or fifty men with hoes, spades, or forks, and in a manner every way superior both as to depth, exactness of action, and quality of result

In the stabling of animals it is well to observe that too low a temperature calls for the use of a greater amount of food. Animal heat must be furnished, and in cold stables this can only be done by increased digestion; proper ventilation is also called for, for the exosmose action of the animal throws forth from the surface of its body, large quantities of gases, which should be removed by proper ventilation, as rapidly as presented. In addition to this method of freeing the stables from such base materials, their bedding should contain those materials which are capable of absorbing those excretory gases, which may be brought about by seiving plaster under the bedding, filling a concave gutter passing beneath the hind legs with swamp muck, decomposed by the lime and salt mixture, with charcoal, or with head-lands. This will not only receive urine as voided but will also absorb all those gases which, if remaining near them in excess, are calculated to reduce the health of the animals.

All must have observed the amount of ammonia given off from the feces of animals in stables, and where the mucus membrane is exposed, as on the surface of the eye, etc., it is peculiarly annoyed by its presence. When the absorbents we have recommended are present, and proper ventilation is afforded, this prolific cause of disease is removed.

Animals of different ages should not be stabled together; we refer of course to too great disparity of age; the young are found to fail when breathing atmosphere which has been exhaled by older animals, and charged with carbonic acid, etc. It may not be out of place here to refer to similar effect to the human species; it should be remembered that every man renders twelve gallons of air per minute, by breathing, incapable of sustaining human life; hence the deaths at the black hole of Calcutta. This, in degree, is equally true of mules; we

should remember that men and animals breathe air for the purpose of abstracting from it a certain amount of oxygen, and that the lungs, by nature's laws, configure themselves so as to take in the greater or less amount at each respiration, dependent upon the extent of dilation of the atmosphere. If we walk up hill, holding in our hand a closed balloon filled with atmosphere, even if but a single foot in diameter, and made of varnished silk or paper, it will burst before we ascend one hundred feet. This is due to the fact, that as we ascend in the atmospheric ocean the weight of the superincumbent portion lessens, and while at the surface of the sea it impinges itself with the weight of fifteen pounds on every square inch, it lessens as we ascend the mountain side; this dilation of the outer air permits the air within the balloon to expand, and the consequence is the bursting of the balloon. Birds of high flight have larger air vessels, because they are called on to breathe a larger amount of atmosphere to procure the same amount of oxygen. Fishes in mountain ponds contain air vessels of larger size than those of fishes found in the streams of the valleys. They have the power to compress their air vessels, so as to sink, as in winter, to a depth where they can find a proper temperature to enable them to exist. This temperature seems to be about forty degrees, which is the usual temperature of the blood of a fish in full health.

The man or animal residing on a mountain, always has a broad chest and large breathing apparatus. The City of Mexico, 9000 feet above the level of the sea, has never contained one consumptive man, not emigrating there, while the level lands of Mexico, nearear the sea, find pulmonary diseases their particular scourge. The hardy mountaineer is a common expression, and it is usually attributed to his active habits; but we have known many broad chested men residing on mountains, who indulge in excessive indolence, and the same may be observed of animals. Horses, oxen, sheep, even the wild animals in mountainous districts, are found to be broad chested; but if the God of nature had not provided the means by which the capacity of our lungs could be increased as we ascended the mountain side, every being would be forced to remain at a defined level. Pulmonics who go to the islands of Cuba and Santa Cruz, are materially benefited, while those who remain in the sea coast towns, die, for want of that condition which prevent the surfaces of their tubercular lungs from coming in contact with each other. As they ascend the mountain, they are called on to make respirations of a greater quantity of dilated atmosphere, each respiration is required to be of the same weight, and therefore of greater bulk; this prevents the slight breathing so readily observable in the growth of pulmonic diseases at the level of the sea, and therefore the tuberculous parts never come in contact with each other, and the patient has a hope of a recovery from his malady. All these facts are applicable to animals. They should never be placed in cellars, where the denser atmosphere will not call for full mechanical action of the lungs; we have known many an incipient consumptive relieved, by removing his dormitory from the ground floor to the fourth or fifth story of the

house. In addition to these effects of natural law, the owner of a stable should remember that the atmosphere is the vehicle of all of the exudations from decaying nature, also of the gases given off from the surface of every animal; and imperfect ventilation, like the pest houses of Egypt in a plague, reproduces disease while nature is making efforts to ward against it. All this has to be compensated for by extra amounts of food, sometimes ending with loss or failure either of the life or vigor or of several animals. Clean stables, well ventilated and at proper temperature, constitute in a great measure the difference between successful and unsuccessful farmers.—*Working Farmer.*

Deep or Shallow Vessels for Milk.

Many suppose that the quantity of butter obtained from milk depends greatly upon the treatment before churning, particularly upon the kind of vessels it is kept in. Thus, some prefer deep pans, and some will use none but shallow; some add saleratus to the milk to keep it sweet longer to give the cream more time to rise. Experience has convinced me that the amount of butter depends on the quality of the milk, rather than on its management. All the butter contained in the milk can be obtained, and no more. I remember fifty years ago, that my father, who had thirty or more cows, tried several experiments to ascertain this point. He first procured large, flat "keelers,"—wooden tubs about four inches deep—but the labor required to keep them sweet was so great, that a number of twelve-quart tin pans were also used. There was no difference in the amount of butter obtained from each. After this he was persuaded to have smooth, oak tubs made, each holding about four gallons, having been told that the milk would remain sweet much longer in them and the cream would be increased, but there was no improvement in the quality. I have for years used twelve-quart tin pails for convenience in handling, and find by keeping the temperature right, to allow a moderate cooling and a gradual rising of the cream, I get all the butter there is in the milk, which is the best any plan can do.—*American Agriculturist.*

The Tobacco Worm Poison. — Cobalt.

Mr. Wm. Shepherd, of Anne Arundel county, to whom tobacco planters are indebted for his continued experiments with the tobacco worm poison, of which we have made frequent mention, informs us now, that he thinks any tobacco planter may protect his own crop by the poison, even if his neighbors neglect it. He says the poison, if made stronger than heretofore recommended, is more effectual—that he would use as much as a quarter of a pound of cobalt to a common tumbler full of water. The cobalt should be reduced to powder by the druggist when purchased. He thinks that loaf sugar, enough to make the water very sweet, is better than honey—not so liable to sour. The mixture is put into a small bottle, with a quill in the cork, and two or three drops through the quill deposited in the Jamestown blossom, or in the blossom of the tobacco plants. The horn blower will suck the poison till he dies.—*Amer. Farmer.*

For the Southern Planter.

Monthly Abstract of Meteorological Observations—Kept at the Virginia Military Institute, Lexington, Va., January, 1861—Elevation above the Sea, One Thousand Feet.

	THERMOMETER.				BAROMETER.	RAIN.	REMARKS.
	7 A.M.	2 P.M.	9 P.M.	DAILY MEAN.	DAILY MEAN.	INCHES.	
1	5.	20.2	15 5	13.56	29.310		Fog in morning, clear in evening.
2	5.	27.2	30.2	20.8	29.032		Cloudy, rain.
3	32.	39.2	35 6	35.6	28.689		Cloudy, rain during night.
4	36.1	36.8	26.6	33.17	29.032		Cloudy.
5	15.2	33.2	23.7	24.70	29.269		Cloudy, clear.
6	8.2	32.5	31.	23.9	29.153		Cloudy.
7	32.4	41.	37.5	36.9	29.199	0.097	Cloudy, rain from 9–10 A. M.
8	38.2	46.5	34.	39.7	28.908		Cloudy.
9	38.5	37 4	34.2	36.7	28.718	0.361	Cloudy, rain.
10	34.8	41.1	31.5	35.8	28.682		Cloudy.
11	21.	29.8	39.5	30.1	28.865		Cloudy.
12	3.7	40.	38.5	38.5	28.837		Cloudy.
13	25.4	27.8	24.2	25.8	29.347		Cloudy.
14	21.8	29.	30.6	27.1	29.139		Cloudy, rain, snow.
15	32.1	34.8	34.	33.6	28.812		Cloudy, rain.
16	35.	48.8	45.2	43.	28.587	1.475	Cloudy, clear, cloudy.
17	39.2	46.8	35.5	40.5	28.989		Cloudy, clear.
18	34.8	35.	34.7	34.8	28.898	0.421	Cloudy, rain from 6½–12 M.
19	41.8	47.4	42.	43.7	28.863	0.915	Cloudy.
20	31.7	39.2	29.	33.3	29.033		Clear.
21	22.7	39.2	32.1	31.3	29.187		Cloudy.
22	18.2	36.3	27.2	27.2	29.333		Clear.
23	24.4	29.5	24.4	26.2	29.385		Cloudy, snow about 3 inches.
24	29.4	36.2	31.8	32.5	28.902		Cloudy, rain.
25	30.2	40.1	32.8	34.3	29.040	0.915	Cloudy.
26	31.1	26.5	28.8	28.8	28.981		Cloudy, snow.
27	31.8	35.8	27.8	31.8	29.004	0.624	Clear.
28	24.2	31.2	21.2	25.5	29.018		Clear.
29	21.2	48.9	42.8	36.9	28.839		Cloudy, clear.
30	37.4	38.	26.1	33.8	29.976		Clear.
31	21.	33.2	26.4	26.8	29.063		Clear, Cloudy.

JANUARY.	MONTHLY MEAN.	MAXIMUM.	MINIMUM.	VARIATION.
BAROMETER.	29.004	29.516	28.509	1.007
THERMOMETER.	31.8	48.8	5.	43.8

Amount of rain and melted snow, 3.893 inches.

WHITEWASH.—Whitewash of a superior quality, is made by mixing one bushel of lime, (slacked in hot water) one quart of salt, four of sugar, two ounces isinglass, and two ounces saltpetre. Each ingredient dissolved in hot water, and the whole mixed while hot. This whitewash will neither wash nor rub off, and will last for years.

For the Southern Planter.

The Skin and its Functions.

This paper will be the first of a series of articles to be presented, from time to time, to the readers of the Planter; the object of which will be to discuss various physiological subjects in a plain and practical manner; and those will be especially selected which are calculated to awaken the attention, and arouse the interest of the farmer and naturalist.

The subject of the present article is, unquestionably, one of much importance and no little interest, inasmuch as the skin may be considered an immense gland, scarcely inferior, in respect to the value of its functions, to the liver or the lungs, and hence playing a much more serious rôle in the health of a man and lower animals than is commonly supposed.

The skin subserves, at one and the same time, the various purposes of protection, absorption, secretion, and sensation. Each of these will be considered in order, but before doing so it will be necessary to give a brief description of the structure of the integument. It is strong, firm, pliant, and elastic, and may be said to consist of three layers, an internal, which is soft and made up of cellular and adipose matter—a middle, true skin, or derm, formed of interlaced fibres, nerves, blood-vessels, and absorbents—and lastly, an external layer, or epidermis. This external layer, or cuticle, will first claim our notice, as being chiefly concerned in the office of protection, and is composed of a series of layers of flattened cells, super-imposed and cemented together. Under the microscope it presents the appearance of a tesselated pavement, and so constructed as to leave no vacant spaces between the edges of the cells, each stratum being cemented by an exuded plasma from the true skin beneath. As the formation of this cuticle is continually going on from within, so its superficial layer is continually falling off, constituting what is known as desquamation, or loss of dead skin, and an equilibrium between its loss and re-production must be maintained, in order that perfect health be preserved.

This phenomenon of desquamation frequently takes place in a most obvious manner after certain cutaneous diseases, such as scarlet fever, measles, erysipelas, &c.; and there are certain animals, especially those of the reptilian order, which desquamate the entire cuticle at regular periods of the year, which process is commonly termed "casting the skin." By means of the cuticle, the delicate extremities of the sentient nerves of touch are protected, and thus the tactile sense is not impaired by pain. Again, it protects the true skin, and prevents the absorption of very many deleterious gasses, and liquid animal and vegetable poisons; for it is well known that their contact is not usually productive of injury unless the cuticle be denuded.

In most of the mammalian class, the skin is more or less thickly covered with hairs, which subserve the two-fold purpose of protection from injury, and prevention of the loss of bodily heat. Indeed, of so much importance has this tegumentary appendage been deemed, that it has been proposed as a basis of

classification of animals, viz: *pilifers, pennifers,* and *squamifers,* accordingly as the skin is protected by hairs, feathers, or scales. The hair developed on animals having different physical uses, has received different names, and although apparently so unlike, are but modifications of one and the same product. We are familiar with them under the names of quills, bristles, fur, wool, hair, down, &c.

In regard to wool, the colour of it, whatever that may be, is dependant, probably, upon a fatty substance, which is soluable in boiling alcohol, and if it be removed from any kind of wool, the colour is transformed into a yellowish grey. Sulphur exists in all kinds of hair, and by union with iron, imparts to it a black colour. Advantage is taken of this fact in the manufacture of hair dyes, for the sulphur of the hair will readily enter into chemical union with the salts of silver, mercury, lead, &c., forming sulphurets, which give the hair a dark hue.

Climate very materially influences the development, growth, and texture of the hair. Thus, in the arctic regions, we have the thickest and finest furs, obviously because they are required to prevent the loss of bodily heat, being non-conductors, and to check radiation also; while under the tropics the hairs of animals are short, sparse, and stiff, or even entirely wanting. The same law regulates the production and development of hair during the winter and summer seasons in temperate latitudes, as exhibited in the shedding of hair—the moulting of birds, &c. The growth and development of feathers, or the plumage of birds, is entirely analogous to that of the hair, and like it, an epidermic product. The plumage of birds differs not only among genera, but in the same species at different seasons, or in different climes, the most gorgeous and brilliant being found in the torrid zone. There is this remarkable difference, however, between the physiological use of feathers and hair; that while both subserve the purpose of protection, ornament and beauty, each feather is penetrated by a central canal communicating with the lungs. This admirable contrivance greatly extends the respiratory apparatus, and by the extensive introduction of air, not only renders their bodies specifically lighter, enabling birds to fly with ease, but also to maintain their long continued flights, and, at the same time, keep up their bodily temperature. All aquatic birds have their feathers protected by an oily material, which enables them to frequent the water without fear of wetting their bodies.

Absorption by the skin—That the skin possesses the power of absorbing fluids with great facility is a matter of every day experience, in the immersion of the body in water to allay thirst, in the absorption of medicines when rubbed into it, by the passage of gasses through it, &c. But in addition to this function the skin is an important agent for exhalation, both in the form of vapor and also of carbonic acid—the former giving rise to cutaneous transpiration or insensible sweat, the latter to cutaneous respiration. By the former means is accomplished the elimination of a very large proportion of all the matter thrown out of the system—possibly as much as five-eighths—while by the latter process the extrication of much carbonic acid is achieved. The average diurnal quantity of water exhaled from the surface of the skin is about thirty-two ounces, or one

quart, and this quantity is independent of the amount lost by sensible perspiration or sweat. But it must be remembered that this exhalation varies greatly according to the hygrometric and thermal state of the air. The more humid the atmosphere the less the exhalation, and conversely the dryer the air the greater the amount exhaled. Hence this loss is greater in winter than in summer, while the reverse is true of sensible perspiration. Whenever this exhalation is checked by cold and moisture, an increase in the urinary secretion compensates for it, and thus prevents the system from suffering injury.

To ascertain the importance of respiration, as carried on through the skin, experiments have been performed upon domestic animals, such as horses, sheep, and dogs. These animals have first been carefully shaven and then their skins painted over with an impermeable varnish. This of course suspends both cutaneous respiration and exhalation. The animals so experimented upon have uniformly died in a few hours, and after death the organs and tissues of the body were found gorged with venous, black, or carbonized blood; thus proving that the cause of death was the non-interchange of oxygen and carbonic acid through the skin, and that the condition was one of asphyxia. In other words, that death was as effectually, though more slowly produced, as it would have been by the suspension of pulmonary respiration.

Now what is true in regard to domestic animals is so, inferentially, with man; for if in him asphyxia and death be produced by suspending pulmonary respiration for the brief period of three or four minutes, it is reasonable to suppose that a complete suspension of cutaneous respiration for two or three hours would be attended by the same fatal result.

These facts are suggestive and bring prominently forward the serious importance of attending to the state of cutaneous cleanliness not only in man himself, but also in those domestic animals which minister to his wants. But this subject, together with kindred topics, must be deferred to another paper. M.

Spaying Cows.

Translated from the "Journal d' Agriculture Pratique."

A farmer has recently demanded that there should be a law made to prevent the slaughter of calves; it would be necessary to demand at the same time a law requiring the farmer to produce two, three, or four times the usual amount of forage. The second decree should at once follow the first, for we cannot suppose it would be possible for a farmer to keep or raise a calf when he has not food sufficient for it.

If we consume more of veal in France than in England, it is for the reason that we produce less roots and forage. Now in interdicting the slaughter of calves, we do not make the least gain in the world. Is it true that at the end of year there remains a surplus of unconsumed forage? If not, it is not true that consumers are wanting.

This simple argument answers the objections which have been made to the spaying of cows.

"But you diminish the production of meat, you dry up the sources of public aliment.

Do you believe, then, that if we spay cows at the age of eight or ten years, after they have borne three or four calves, the quantity of edible meat will be diminished? It is probable that the number of calves will decrease, that is to say, the number of calves from old cows, and which are killed at six weeks old—animals of bad shape, with skeletons prominent with narrow chests and big bellies, poor consumptive beasts, children often of consumptive mothers.

There will be, perhaps, less veal, but more beef. It is not so much the numbers of animals killed upon which depends the quantity of edible meat, but the state of the animals as to their more or less perfect fattening. What advantage is there in having a mass of bones covered with muscular fibres containing neither juice or other nutritive qualities? What we do need is flesh, and good beef flesh, when at least it can be produced by the cow.

Do you not know that among domestic animals the flesh of the female is more tender and succulent than that of the male? To make the cow a better animal than the ox, we have but to do as with the male,—to take from them those organs which have become useless and which by their powerful influence upon the animal economy tend to prevent their taking on flesh.

We shall thus slaughter less poor cows and more good ones. There are old worn-out cows killed at fifteen or eighteen years of age, of which the flesh is hard, tough, and with but little nutritive quality, to the detriment of the reputation of the beef of cows. But we are well convinced that the production of meat in place of being diminished will augment. Instead of losing nourishment in a bad machine which consumes much and returns nothing, we put roots and forage into an excellent apparatus which receives little and returns much. A beef animal is a machine to produce flesh, as the field is a machine to produce corn; there are good and bad animals in point of fattening, as there are good and bad fields in point of production.

Consider an unhappy man afflicted with a tape worm; he eats like an ogre and remains as thin as a nail; nothing profits him. Most old cows have a tape worm.

But the production of milk? you will say. Nourishment given to a spayed cow produces a double effect. It augments the production of milk at the same time that it predisposes the animal little by little to lay on fat; thus when the cow does not produce a quantity of milk sufficiently remunerative, she is found presently fatted and all ready for the butcher. A good spayed cow gives in the first year of milking four, five, and six thousand litres (quarts) of milk. These figures have been sufficiently established by the most unquestionable authorities.

The flow of milk is as abundant during the year as in the first days, and lasts

much longer than with an ordinary cow. It has been estimated that for an ordinary milch cow receiving sufficient aliment, the augmentation of milk may be reckoned at the least at thirteen hundred and fifty litres.

On the other hand, the yield of milk is not only superior with spayed cows, not only is the fattening of these animals quicker, more easy and complete, but the milk will return a third more in butter and cheese, and the flesh is more succulent, tender, and more thoroughly penetrated with fat.

This double phenomenon is easily explained by the youth of the cow, by the distance from calving, by the placidity of the cow disembarrassed of the troubles caused by the rutting seasons. The digestion is always good, and the animal is always quiet, and all that it consumes goes to its profit.

In proportion as the time of calving grows distant, the milk becomes more equal and more homogeneous; it acquires, in a word, more of the quality of that which comes from a cow not spayed when she is in a state of perfect quiet.

But it is often very difficult, if not impossible, to obtain without spaying, this state of quiet; above all, when we give much provender to obtain large products. And if we prevent the covering of the cows, what disorders are produced in the milk functions from the fact that the natural desires are unsatisfied? How many cows contract then the terrible malady of hysteria or nymphomania? The number of cows "bull mad" can fairly be estimated at one-tenth, and all these cows are sick animals.

It is easy to render an account of the advantage offered by spaying cows under the report given of their milking qualities, when we know to what regimen the herdsmen in the vicinity of Paris submit their milch cows, to the end that they may relieve them of those affections which spaying makes completely and suddenly to disappear.

The milch cows of Paris receive abundant and succulent nourishment, but that which debilitates them and renders them lymphatic, and augments the quantity of milk to the detriment of quality. They are confined permanently to stables, and never allowed to see the light, in order that the rutting season may be delayed as long as possible. They become rapidly consumptive, and produce poor milk during their period of lactation, and give, after they are slaughtered, flesh worse than the milk.

With spaying, the necessity of this unwholesome treatment ceases. The herdsman buys good cows after their third or fourth calving; he has them spayed, and puts them on good healthful treatment; he obtains more and better milk than from his poor and consumptive cows. When the milk diminishes the animal takes on fact, and is sold for a good price and in excellent condition.

These are the different considerations which have determined us after a long and serious study of all the facts gained by repeated experiments, to put the spaying of cows among the number of operations that it is needful to encourage among farmers.—[*American Farmer.*

From the British Agricultural Magazine, Plow and Farmers' Journal.

Jethro Tull's Principles of Cultivation.

BY PROFESSOR WAY.

Two lectures were delivered [in 1852] on the above subject, at the Rooms of the Royal Agricultural Society, in Hanover-square.

FIRST LECTURE.

Prof. Way stated that his object in the present lectures was to call attention to the principles enunciated by Jethro Tull fully a century ago, and to make such quotations from his work as would seem most forcibly to illustrate his views and the arguments by which they were supported. In doing so Mr. Way wished it clearly to be understood that he was not advocating any system or practice founded upon those principles, but simply pointing out how far the ideas of an author who wrote almost before the dawn of modern chemical science were compatible with the facts and laws which have been since recognized and established. As might be anticipated, wherever Tull attempted any scientific explanation of facts, the terms he employed were antiquated and obsolete—in accordance with the vague and fanciful theories of the older chemists and physiologists, but utterly inconsistent with the present state of these sciences. Still, in the midst of all these crudities there might be seen a large amount of philosophical reasoning; and those who carefully studied the writings of Tull would find that many of the discoveries in agricultural science which are accorded to philosophers of the present day, were more or less clearly anticipated and announced by the author in question. Cobbett, to whom we are indebted for the most convenient edition of Tull's book, takes occasion in his preface to pay a deserved compliment to the excellence of its contents, and to remark that the re-publication of the work would strip many modern agricultural writers of their borrowed plumage. The great principle of Tull was, *that the soil and the air together contained all that was necessary, without the aid of manure, for the production of luxuriant vegetation;* but that, in order to render the one and the other available for this end, *it was necessary that the soil should be opened up by abundant pulverization and comminution of its parts.*

The arguments with which this view was sustained were most forcible and convincing. The better to illustrate his meaning, he had compared the parts of the earth to which the roots of plants attach themselves with the grass or herbage on which animals feed. Thus the fissures or openings through which the roots penetrate, and the internal surface upon which they spread their delicate fibres, constitute, in Tull's language, the "pasture of plants"—a most happy expression, and one which facilitates in the mind the comprehension of his subsequent reasonings. So then, as an animal will grow and fatten in proportion to the suitability in quality and sufficiency in quantity of the food to which it has access, in the same manner the rapidity of growth and the luxuriance of a plant will depend upon the nature and abundance of the pasture provided for it in

the recesses of the soil. But the pasture of plants differs from that of animals in this important respect—that whilst in the latter case the quantity can. only be increased by taking in more surface, the pasture of plants may be indefinitely extended and renewed by the pulverization of the soil, which is constantly exposing new surfaces to the roots. Nothing can be more true, as Tull says, than that for all practical purposes the soil is infinitely divisible; and that, since the roots of plants cannot by possibility occupy every insterstice which may exist in a highly comminuted soil, each additional stirring is tantamount to the production of a new internal surface, and a fresh source of food. Then he argues that constant comminution and opening of the soil not only enables the roots of plants to benefit by the stores of food already existing in the soil, but that it at the same time materially increases that stock, by letting in the atmosphere loaded with invigorating and healthful supplies. It is obvious that Tull could have had only a faint notion of the changes in the nature of the soil which might be brought about by the influence of the air, and we can imagine the pleasure which he would have derived from the acquisition of the more exact knowledge which in relation to this point we now possess; but none the less was he convinced that such an influence was exerted, and one of the objects of his method of cultivation was to take full advantage of it. Acting upon these principles, Tull had introduced a system of cultivation of crops planted in rows by the drill, and had earned thereby the gratitude of posterity, which was exhibited in the almost universal adoption of that system. But he had also attempted a method of growing crops which had not been so generally followed. In addition to the provision for stirring the soil between the rows of plants, he had left intervals of varying but very considerable width, between every second or third row, which enabled h'm at all times of the year to carry out his principle of pulverizing the soil. These intervals were in fact in the position of a naked fallow for the year, and were in the succeeding season, in their turn brought under a crop. Mr. Way did not intend to enlarge upon the practical part of this subject, which many of his hearers understood far better than himself; but he wished, irrespectively of any particular form of accomplishing that end, to impress upon them the great importance and value of a thorough comminution of the soil, both as rendering available its present riches and enabling it to receive from the air whatever beneficial effects the latter was able to produce. Mr. Way read a number of passages from the author's work, commenting upon and explaining them as he proceeded, and concluded his lecture by commending the book to the careful study of all those who had not yet become acquainted with it.

SECOND LECTURE.

Prof. Way's object in this second and concluding lecture was to examine how far the views and principles of Tull were consistent with the modern discoveries of agricultural chemistry. Plants consisted of certain organic and mineral ele-

ments, the nature of which was now well understood. The question was, could these substances be supplied by the air and by the soil without manure, as Tull supposed? It was pretty generally conceded at the present day that carbonic acid, ammonia, and water, together, were capable of furnishing all that was necessary to build up the organic structure of plants; whilst no soil of ordinary fertility would be found, upon examination, to be absolutely deficient in any of the mineral ingredients that were required by vegetation. The air contained both ammonia and carbonic acid, but it might be open to question whether in sufficient quantity not merely for a *natural* but for a *forced* production of wheat and other crops, such as alone would suffice for the wants of a populous community like that of this country. The quantity of carbonic acid in the air had been found by repeated experiments of M. Saufeure to amount, on the average, to a thousandth part of its weight, and Liebig had calculated that at any one time there was in the air as much carbon in this invisible form as would suffice for the production of the whole coal fields existing throughout the world. It required no stretch of the imagination, therefore, to suppose that with the air constantly in motion, and constantly renewed to the roots of plants, they might receive from this source all the carbon which was required for their growth. Whilst, too, every disintegration of the soil gave access to this carbonic acid in larger quantity for the direct supply of food, indirectly it contributed to the sustenance of plants by rendering available the necessary mineral elements of their food, which water impregnated with carbonic acid was capable of dissolving. With regard to the quantity of ammonia in the air, we did not possess such satisfactory information. Of its existence there, no one entertained a doubt; it was produced by the decay of animal and vegetable bodies, given off in the exhalations of living animal bodies, and probably in the sweet perfumes of flowers, and thrown out in certain parts of the world in immense quantities by volcanoes. But to ascertain the proportion of ammonia in the air was extremely difficult, and although it had been attempted by more than one able experimenter, the results must only be looked upon as distant approximations to the truth. Fresenius, to whom the most careful experiments on record in regard to this matter are due, found that 1,000,000 parts by weight of air contained 0.133 parts of ammonia. Without stopping to examine the probability of these figures representing the average amount of ammonia in the air, we might ask whether such a quantity would suffice for the wants of an abundant vegetation. This question it was impossible to answer. Mr. Way's own recent investigations had brought to light the existence in the soil of certain double silicates, possessing the power of abstracting the carbonate of ammonia from the air with as much avidity as if they were strong acids. A good soil, well opened by cultivation, would therefore be constantly at work, day and night, collecting ammonia from the air; and the quantity that could be so obtained would only be limited by the frequency of the renewal of the air. Of course we could not say how often this would take place; but what with alternations of temperature, differences in the

heat of the soil and the air, the influences of wind, and perhaps also a constant interchange in the particles of air themselves, it was evident that the renewal of the air in the soil, and the consequent acquisition by it of ammonia, might go on to a very great extent. And it was worthy of remark, too, that this collection of ammonia by the soil was quite independent of rain and dew, and was always proceeding. The more, therefore, the soil was exposed to the air the richer it would become. Of course Mr. Way spoke of soils containing a sufficient quantity of clay. Some light soils there might be that would be injured, not benefitted, by such exposure. Mr. Way went on to speak of the experiments of the Rev. Mr. Smith, at Lois-Weedon, expressing the great gratification which he had experienced from a visit to that place. These crops of wheat, which were now growing on land which had been for six years under wheat without manure of any kind, looked as if they had received a dressing of ammoniacal salts; and that, indeed, was the fact, though the ammonia had been added not directly, but indirectly, and from the air, by the abundant cultivation which Mr. Smith's method enabled him to give. Mr. Way was of opinion, then, that, so far as the organic elements of vegetation were concerned, there was no absolute impossibility, but, on the other hand, every probability, that they might be secured in all abundance for large crops without manure, provided that the soil was fully exposed to the influence of the air. The only question that remained was in regard to the exhaustion of mineral matters by this mode of cropping. Mr. Way believed that the danger of mineral exhaustion in soils was frequently very greatly overrated. There was no doubt that the continuous cropping by wheat, or any other plant, without the return of anything in the shape of manure, would gradually, but certainly, reduce the quantity of mineral matter contained in the soil; but the quantities so removed were now accurately known, and it would be found that a continuous course of cropping by wheat for many years took from the land only a very insignificant quantity of these substances. The following table showed the amount of phosphoric acid, potash, &c., removed by a large crop of wheat in one year and twenty years respectively, and in another column of the table would be found the per-centage composition which the soil must have to yield them for twenty such crops:—

THIRTY-FIVE BUSHELS OF WHEAT AND TWO TONS OF STRAW.

	1 crop. lb.	20 crops. lb.	Per-centage removed from soil by 20 crops.
Silica, . . .	171	3420	0.152
Phosphoric acid, .	30	600	0.027
Sulphuric acid, . .	8	160	0.007
Lime, . . .	16	320	0.014
Magnesia, . .	10	200	0.009
Potash, . .	39	780	0.036
Soda, . . .	3	60	0.003
	277	5540	0.248

The per-centage removed from soil by 20 crops is calculated on the assumption that the soil is 10 inches deep and weighs 1000 tons.

Those who had had anything to do with the analysis of soils would see that no soil of ordinary fertility would be found without a small quantity of those minerals here mentioned—indeed, it is usually the case that a loamy soil would contain from two-tenths and upwards of potash, and other things in proportion; and although the whole of this might not be available at any one time, the constant stirring of the land bringing into play the action, furnished a constant supply adequate to the wants of the plants. But although there might be no danger of exhausting the land by this system of cultivation, Mr. Way did not see what good reason there was for continuing it on the same land for more than a certain number of years—say seven or ten—and then alternating with other land which had been meanwhile under manure. In conclusion he begged to say that, having shown as far as he was able, the admissibility of the improved Tullian system on theoretical considerations, his duty was over: it was for practical men themselves to test thoroughly the merits of the plan, and to decide upon its ultimate adoption or rejection.

For the Southern Planter.

Defense of the "Rafter Level;" Separating Onion from Wheat, and Protection against Sheep-killing Dogs.

MARCH 18th, 1861.

DEAR SIRS.—In your last number I have just read, with much pleasure and profit, the premium Essay of Mr. Edmund Taylor, and while I ratify the most of his positions, and smiled at his happy hit at "the Devil on two sticks," I must nevertheless take leave to make my earnest protest against his denunciation of the "*rafter-level as utterly useless.*" I know not how they are made, or how used in his section, but opine that he has never seen one rightly constructed. For fifteen years or more I have used one, and would not be without one for a hundred times its cost. Neither can I believe that his "legged scantling" will answer well unless supplied with proper pedestals or horizontal foot-boards. Anyhow, I would not exchange mine for his. I admit that as first used, without pedestals to obviate depressions, the Rafter-Level was unreliable on plowed or uneven land; but with horizontal foot-boards attached from two and a half to three feet long, I know from years of experience that the Rafter-Level thus constructed is as reliable, cheap and convenient as any instrument of this kind can possibly be. Being too old to manage one myself, I trained a couple of my men to use mine, and though not smarter than negroes generally, they manage it without any difficulty and with rare failures, and travel with it almost as fast as they can walk. I very seldom superintend them, but entrust them with general directions, and I am sure that their work will abundantly commend both them and the implement. Anyhow, I would be very happy to compare the results of my Rafter, managed with negroes, with the results of friend Tay-

lor's, even if managed by himself, and I will give him the benefit of my horizontal pedestals to help him.

While with pen in hand, I trust I may be pardoned if I drop another might in your charity-box for our brother farmers. A portion of my farm, which has six shifts, is badly infested with wild Onion,—and the more so the seldomer it is cultivated. Year before last a portion of my wheat-field was so much beset with this pest that in reaping I ordered it to be gathered and kept to itself. The land being well manured, the grain was very good, and the quantity too considerable to be thrown away or given up without an effort to redeem it. Wherefore, after threshing and cleaning the body of the crop, I then threshed the infested portion, and tried to clean it with the fan, but soon found it was labour to little avail. Despairing of this means, it occurred to me that the Onion would probably *float on water*, while I knew that sound wheat would *sink* to the bottom. I determined instantly to test the idea, and on doing so in a tumbler of water I was much pleased to find the experiment admirably successful. Without any difficulty, except the labour of toating the water, pouring in the wheat and skimming off the floating Onions, I soon washed and cleared my wheat, and when dried, had it ground into fine and pure family flour. I deem this a very valuable discovery, especially to sea-board farmers, if they have found no better mode of separating the Onion. For large crops this means may not be available without appropriate fixtures, but for seeding and for family flour it may be used without difficulty and with much despatch. The quantity of Onions thus separated would, I suppose, amount to three bushels. But I am grieved to add, that this triumphant success cost me no less than from twenty-five to thirty dear little Muscovies, which, as soon as they espied the bright shining globules poured out to the ground, gathered themselves with more than usual alacrity and delight to the tempting treat; but, alas! not one escaped, but in an hour or so they all paid the sad penalty of their delightsome debauch by giving up the ghost in violent convulsions, and for whom my old house-keeper mourned one week at least.

And while in the good spirit of communicating, perhaps my brother farmers will not grumble if I drop them another mite in your treasure-box. In our section, dogs have ever proven a serious impediment to sheep-raising. My own flocks, in particular, suffered from this enemy so often and so much, that I was once on the verge of abandoning the care altogether. Like other beasts of prey and assassins in general, dogs do their depredations under cover of the night, and rather shun the day, lest they be identified and have to pay the penalty of their crime. Now, I have found a remedy for this pest also; and it is as simple and as sure as my other mite. It is to *pen* your *sheep* with one, two or as many more *cows* as you like. *Cows* having young calves are preferable. Cows, as everybody knows, abominate dogs, and will not suffer a dog to tarry with them a minute in the same pen; and hence they are a certain defence against this enemy. I pen them also for their manure, and in bad weather I

put them with my cows under a common shelter. Whoever may try this remedy, will never repent it, and if he values mutton and wool as I do, will never drop it, while there are any dogs to fear. But I must stop, lest I be deemed vain-glorious of *mites*; and three mites at one offering ought to suffice for a sexagenarian. Your friend,

Mount Latium. R. H. DE JARNETTE.

Influence of Different Kinds of Manure on Herbage.

The grasses form a most important tribe of farm plants. Nutritious in their bulky green state, and highly conducive to the health of the stock which browse upon them in our pasture fields, they are no less valuable when dried into hay. The natural history of the grasses has long since been written; they are what belong to one great family of plants—the graminaceous—and possess certain characteristic properties, by which we readily recognize them. The chemical and other properties of the grasses differ very considerably. One contains more albuminous compounds; another, more mineral ingredients; one is most nutritive at the period of flowering; another contains most nutritive matters when fully matured. It is, however, singular that we are not in possession of reliable data whereby to pronounce an opinion on the relative merits of the grasses. Science has thrown some light upon this subject; it is but a dim glimmer which prevents our seeing the entire distance before us. There is a dark place which must be illumined, and an ignorance which must be corrected, ere the farmer and the grazier can truly balance the merits and demerits of particular grasses, for particular purposes. Chemical analysis alone will not accomplish all that we require, any more than the empyrical conjecture of the more practical man; the two must coöperate, and naturally correct and assist each other.

The grasses, like other plants, are amenable to those various physical agencies which influence vegetable life. Heat, air, and light, exercise their own distinctive functions in modifying the size, etc., of plants. That there is a most intimate connection, too, between the soil and character of the vegetation which it naturally bears, is well known. It is also a well known fact, that the manures with which we top-dress grass lands very considerably influence the character of the sward, diminishing the proportion of one species of grass, and increasing that of another. The laws by which these modifications were effected, remained unknown, however, until Messrs. Lawes and Gilbert undertook to investigate the subject. In experiments instituted to test the effects of different manures, in simply increasing the valuable yield of grass, they were so struck with the marked effects of some of the manures in destroying certain plants and families of plants, that they sought the assistance of the late Prof. Henfry, in classifying the plants composing the sward. The plots selected for botanical examination were:

1. Not manured.
2. Manured with ammoniacal salts alone.

3. Manured with mixed mineral manures alone.
4. Manured with do. and amoniacal salts.
5. Manured with do. and double quantity of do.
6. Manured with farm-yard manure.
7. Manured with do. and ammoniacal salts.

The herbage was classified chiefly into (*a*) graminaceous plants, (*b*) leguminous plants, (*c*) miscellaneous herbage, principally weeds.

The graminaceous plants formed, at the time of cutting, 75 per cent. of the produce of the unmanured portion; on the part manured with farm-yard manure, they found 87¼ per cent.; 79¾ per cent. when farm-yard manure and ammoniacal salts were used; 72 per cent. on the portion to which mineral manures were applied; 80 per cent. where forty pounds of ammoniacal salts alone were used; 97¼ per cent. where the double allowance of both ammoniacal salts and mineral manures were applied. The quality of the graminaceous herbage varies, no less than the proportion of it which composed the herbage under the different manures.

At one time, the graminaceous portion of the herbage consisted of 66 per cent. of flowering or seeding stem, and 34 per cent. of leaf and undeveloped stem, on the unmanured plot; 59 per cent. of flowering and seeding stem by mineral manure alone; 40 per cent. of the same by ammoniacal salts only; 75 per cent. by the joint application of animal and mineral manures; 67 per cent. by double application of both manures; and 80 per cent. when farm-yard manure and ammoniacal salts were applied.

It has been found that the manures which increase the amount of whole produce, also increase, in a very high degee, the proportion of graminaceous herbage, a conclusion which is not of less interest than importance. The foregoing facts also lead to another instructive conclusion, namely, that nitrogenous manures have a special effect in developing the "proportion of leaves and shoots," while mineral manures tend to the increase of the flowering and seeding of the plants; a conclusion of great practical value to the farmer, as it teaches that guano and sulphate of ammonia produce very different results from those mineral manures which depend for their efficacy on their containing the ash constituents of plants.—*Irish Agricultural Review.*

Cure for Fever and Ague.—Just before the chill comes on have a pot of very strong coffee made and keep it hot, and when the first chill is felt, pour out about a pint and squeeze the juice of a couple of lemons into it, and a little sugar to make it palatable, drink it off, go to bed and cover up warm. One trial of this often cures, whilst two or three trials never fail.

The Worst Form of "Hanging."—The following gives the substance of a verdict of a recent coroner's jury on a man who died in a state of inebriation: "Death by hanging—round a rum-shop!"

Editor's Department.

Clover and Plaster.

A question asked by "A Farmer," in the February number of this journal in regard to the experience of farmers in the use of clover and plaster, suggests a few remarks upon their importance in agriculture. The use of clover and plaster as improvers of land have become so general and the experience of farmers almost everywhere is so decidedly in their favour, that any arguments at this time would seem to be almost unnecessary, if not out of place, if it were not that the question asked by "A Farmer" would seem to imply a doubt upon his mind, and that in our own experience we have seen so many farmers who practically ignore the use of clover, if not both clover and plaster, as to lead to the belief that they know nothing of their virtues.

In every country in which agriculture has made any progress, the growth of certain crops to be plowed in as *green manures* is very common, and in those countries where agriculture is most advanced, their use is almost universal. Prominent among the plants used for this purpose, on all soils suited to its growth, stands the common red clover. Indeed, so well known have its virtues become, that when in the improvement of land, the former gets it in such condition as to produce good crops of clover, judicious farmers regard that land as susceptible of a high degree of improvement.

All plants derive their nutriment partly from the air and partly from the soil; the inorganic portion, that which constitutes the ash when the plant is burned, is derived exclusively from the soil through the roots, while the organic, or vegetable portion, is derived in part from the soil through the roots, and in part from the atmosphere through the leaves—by far the largest portion, in most cases, being derived from the latter source. Those plants, such as clover, which have long roots, take up mineral matter not only from the surface soil, but from the subsoil also, provided it is not too hard to permit them to penetrate it, and when they are turned into the surface soil by the plow, the latter becomes the recipient of mineral fertilizing matter from below, while it at the same time receives large supplies of vegetable matter which the plants derived from the atmosphere. And thus they become important agents in supplying the soil with nutriment for future crops.

The native forest trees send their roots down deep into the earth, many feet sometimes, from whence they draw up and deposit in their stems and leaves such mineral matter as may be necessary for their development; while their leaves are spread out to draw organic food from the air. The leaves, small branches, &c., fall, taking with them, of course, all the fertilizing matter they contain;

thus the surface soil receiving this annual *top-dressing*, becomes more fertile from year to year. Again the exhausted field, after being turned out as no longer worth cultivating, grows up in old-field pines, which deriving their mineral food from the subsoil *below* the exhausted surface soil, and like the forest trees drawing their organic food from the air, a large portion of both of which being returned to the surface soil in the falling leaves, &c., the surface soil in the lapse of years is restored to fertility. In this way thousands and tens of thousands of acres, which were impoverished by the exhausting system of our forefathers, have been restored.

Now, the farmer who grows green crops and plows them in, imitates nature in her processes; his land goes on improving from year to year, or he keeps it in good heart, and he is enabled to take large crops from it without any apparent exhaustion.

"In addition to the matter these plants collect from the air and from the subsoil for the use of future crops, we must not overlook the physical influence they possess. In a strong clay, warmth and porosity are given; and upon light and friable soils, tenacity and firmness are imparted by the fibrous roots. Without a previous crop of this kind, many lands are too light to grow wheat."

Among the plants grown for green crops, clover deservedly holds the first place in our country. Its growth is rapid and vigorous; its roots are long and abundant, &c., so that if cut for hay, or is pastured—if not grazed too close—the roots will still yield a large percentage of organic matter to succeeding crops. It has been shown by actual experiment that the quantity of dry vegetable matter contained in the roots after cutting the clover, is more than half of the weight of the hay which the clover yields.

But we do not propose to confine ourselves to theoretical considerations; the almost universal use of clover by good farmers as a green manure, wherever it can be successfully grown, demonstrates its great value as a fertilizer. It is universally conceded, too, that, excepting in particular localities, the plowing in of the clover crop is the *cheapest possible way to keep up the necessary supply of organic matter in the soil, or to restore it after exhaustion.*

Plaster, on a great variety of soils, is found to exert a marked influence upon the growth of the clover crop, very largely increasing its yield, and thereby becoming an exceedingly valuable fertilizer.

Examples illustrative of the great value of clover as an improver of land, and of plaster when used as a top-dressing to clover, may be found in every neighbourhood in which clover is grown; in our own limited experience we could point to many farms that have been brought up to a high state of fertility by their use. Of these we propose to mention a single one, and we mention this because of the fact, that by the use of *clover and plaster only*, in connection with the straw, corn-stalks, &c., of the farm it has been brought up from a state of great apparent exhaustion to a condition of great fertility. We refer to the farm of Mr. Samuel Line, of Rockbridge. This farm had, for many years before Mr.

L. purchased it, been growing poorer and poorer, and two or three successive owners had been broken up by it. Now it is one of the most productive in the county, the simple result of twelve or fifteen years judicious use of clover and plaster. Mr. Linc's rule is, to fallow his grain crops with clover in all cases, which is kept on the land for from two to three years. The clover is seldom cut, and but little stock is allowed to graze upon it; hence the soil seeds itself from year to year, until now he does not find it necessary to sow clover seed after any crop of grain; the clover follows the grain crop without fail. After breaking up the clover sod, one crop of grain only, except in rare instances, is taken from the land before it is again allowed to come up in clover, after which, as we before remarked, it stands from two to three years. He keeps but little stock on the farm, and hence has but little stable-manure. But all the straw, corn-stalks, &c., are returned to the land, generally as top-dressings to the clover, and now the land in good seasons yields from thirty to forty bushels of wheat per acre, with corresponding crops of oats and corn. Mr. Linc, by this *nursing* system, may not, and we believe has not, realized the same profit from his farm that he might have done had he varied his system somewhat; but all must see that he has been eminently successful, and the great benefits resulting from the use of clover in this instance, furnishes the strongest possible argument in favour of its extensive use by all farmers who look to their own interests, or wish to improve their lands.

The Virginia Central and Orange and Alexandria Railroads.

Through the kindness and courtesy of some of the officers of these two roads, we have lately enjoyed the treat of a free ride over them to Alexandria. As a boy, we were well acquainted with many of the farms situated on them, and had in "auld lang syne" spent many happy months and days among the farmers of Orange and Culpeper, taking then, as we do now, much interest in agricultural operations.

We don't like to acknowledge how long ago it has been since we enjoyed the plain, cordial, genuine Old Virginia hospitality of these gentlemen farmers, since, in our recollections of the past, we cannot trace farther back than "*time was.*" However, we do most heartily rejoice for ourselves, and for them that *time is*, and that they at least are improving its fleeting opportunities in works of usefulness and good example to our agricultural brethren, if the increased value, fertility, and beauty of their farms may be received as testimony in favor of their industry and success.

There are many valuable farms along the route between Gordonsville and Alexandria—the cultivation of which has perceptibly improved within the last few years. The wheat crops were looking remarkably well, and we could see an increased energy and neatness in the preparation of the lands, on the part of the owners, evinced by the general appearance of the plantations.

Much of the scenery is charming to the traveller's eye—particularly if he be

a "low-lander," to whom a glimpse of the mountains is something new and agreeable.

For our own part, we cannot go in sight of the mountains without feeling as if we were a boy again, when the first view we had of them, was our very first assurance that we were to be free from the drudgery of lessons and school for two months of "vacation"—during which we had a perfect right, and the most honest intention, to "run wild," until compelled by "higher law" than our own inclinations to return to schools and lessons again.

Well! we must confess to being *just a little older now*, or we are in danger again of running wild over the memories of "time was."

We must say, however, that having known this region well in earlier years, we noticed it as closely as we could to detect the changes made in it during our years of absence from it. It is as important for the farmer as it is for the politician that he should "tread no step backward." If we would avoid loss, we must press on. We were gratified to note many changes for the better. The improved style of building some fine *new* houses—the *remodelling* of some old familiar ones—the manifest effort to render the tillage of the soil *neat*, as well as useful and necessary, all tended to show an increased cultivation by the farmers themselves, in matters of rural taste and accomplishment.

The country would be still more improved by *Draining*, and we would suggest, to some of our friends there, some experiments with *Tile* for this purpose. We are sure they will be pleased, as well as profited, if they will make them.

In Alexandria we were glad to see so much of the "Old Virginia" feeling prevailing, notwithstanding they live in such close proximity to "the powers that be," *and the big guns and troops of armed men which at present make up so conspicuous, if not necessary a portion of the "forms of government" observed among them.* We found some of the good citizens quite "sassy," politically; or, at least, they might be so considered by some of the members of the "Constitutional majority!"

We heard talk of "secession" amongst them in such tones that we concluded they had forgotten where the "border" is, or that they were not at all frightened by the chances and dangers of the "first fire." They are a creditable set of representative men for the "Old Dominion" to have on her border to show to all incomers as samples of the "Old Virginia Gentlemen." We shall not forget their kindness and hospitality readily. Having no particular claim on either, we found them unmeasured, and enjoyed them exceedingly.

In the city we found evidence of increased energy and business effort among the merchants of the place. We paid a visit to the Guano Works of Messrs. Fowle & Co., and had an opportunity of witnessing the process by which their guano is "manipulated" and rendered "soluble" under the special superintendence of Dr. Stabler. We were glad of the opportunity politely afforded us, as we like to know how the "Peruvian Guano" is mixed with the "phosphatic materials" before it is offered for sale to the public, since we have for sometime

past believed in, and acted upon the theory of mixing the two, upon our own farm.

We have access to the mills of *this* city at all times, and the most perfect confidence in the genuineness and good quality of the guano sold by them and by Messrs. Fowle & Co.

In recommending the "Manipulated Guano" of Richmond and Alexandria, we do not wish to be understood as undervaluing *any put up outside of the State*, but simply to appeal to our own citizens to buy nothing from the other side of our borders, which can be, and is produced among ourselves as cheaply, and of as good quality as can be promised elsewhere.

Some of the best *plaster* we ever examined was being ground and sent off to some of the "Planter's" friends on the Central Railroad, *at the mill of H. D. Wright, Esq., at the rate of Six Dollars a ton, too.*

Look well at this, you Richmond manufacturers, if you please, and see if you can, give us the benefit of a reduction in price *here*. Mr. Wright has a large steam mill, situated between the railroad and the wharf—admirably located and arranged for filling orders with promptness, and our word for it, every customer of his will get satisfaction, in a good article, and good measure. We could wish no friend of ours any better luck than to fall into his hands, as we did.

We looked into the large agricultural warehouse of our old patrons, Messrs. Meade & Marye. We were sorry not to find them at home, but we did find an admirable selection of implements and seeds of every description, needed by our brother farmers.

During our stay in Alexandria we took a ride out to Mr. Geo. D. Fowle's farm, "Burgundy," for the express purpose of seeing the effects of the guano he manufactures upon his own soil. We found it acting well there, and we had the *extra* gratification of closely examining a herd of fine Alderney cattle, the descendants of six cows and bulls, which Mr. F. imported from the Isle of Jersey in 1855. We were so much pleased with them, that we wrote to Mr. Fowle after our return home for their history, and give herewith an extract from his reply, describing them, and a remarkably fine colt of his, which we thought promised great speed as well as beauty:

ALEXANDRIA, March 12th, 1861.

Dr. J. E. Williams, Richmond:

MY DEAR SIR—Your valued favor addressed to my firm is before me, and in accordance with your request, I beg to state in reference to my herd of Alderneys, that they were imported (6 cows and 2 bulls) from the Island of Jersey by myself in the summer of 1855, and were all premium animals, having taken the first prizes at the Fairs of the "Jersey Agricultural Society." I have, at present, about twenty head, having disposed of a number of calves to farmers residing in various parts of the county. Hon. Jas. B. Clay of Ashland purchased from my herd after having examined others. He pronounced my herd to be the most thorough-bred looking he had seen. I have, however, never made an effort to bring them into notice, having imported them for my own special use. My stock

is now becoming rather larger than I desire, and I should like to dispose of a number of calves at moderate prices.

My Black Hawk colt, "Black Prince," was sired by my Black Hawk stallion Greyhound—purchased by myself from a Mr. Stone of Bridgport, Vermont. Greyhound was sired by old Black Hawk, as is proven by a letter addressed to me by David Hill, his owner, and now in my possession. His dam (so says Mr. Hill in said letter) was sired by a horse called "North America," whose sire was "Sir Walter," "said to be from Viaginia." Black Prince's (my colt) dam is my grey mare "Pet," one of the most perfect animals I ever drove. The pedigree is unknown to me. I remain, very truly yours,

GEO. D. FOWLE.

We cannot take our leave of Alexandria without mentioning one article of their "*home produce*," which struck us as being particularly abundant in quantity and very extraordinarily good in quality, to wit—*pretty girls*. Happy boy should he be who lives here, or in Petersburg, surrounded by so much beauty of an attractive kind. They can well afford to brag of their ladies. For ourselves, we are out of the market; and while we cannot help "risking one eye at them," whenever we get a chance, we are *somewhat afraid* to talk too loud, or too much about them, afterwards.

For the Southern Planter.

Suggestions to the Editors.

MESSRS. EDITORS.—As I have been always a subscriber to your excellent journal, and very earnestly desire its full success, you will, I hope, excuse me for venturing to offer a suggestion in respect to the conduct of it. It is, that you adopt the plan of those excellent journals the American Farmer and Rural Register, of having at the commencement of each number a head of "Work for the Month"—with sub-divisions, for the "Vegetable Garden," "Green House," &c. It makes those papers not only agreeable but very valuable, and far more useful and popular than long essays, although these are not to be dispensed with entirely. You will render much service, too, by giving the quantities of seed of all kinds proper to be sown and planted.

Allow me, if you please, to offer another suggestion. It is, to use your scissors more; give us more clippings and cuttings from other agricultural papers, and sometimes even a little bit of news proper. Among the selected articles I would especially ask for Dr. Voelcker's article on Manures, before the Royal Agricultural Society of England. May I ask you to re-publish, also, a description of a subsoil plow, which you will find on page 250 of the number before last of the Farmer, and recommend to some of our vendors of agricultural implements to obtain one or two specimens of it, at least? I will purchase one. If it is the thing it is described to be, it is an admirable implement, indeed, a great dissideratum. LABURNUM.

REMARKS.—We are glad that our old patron "*Laburnum*" has kindly manifested so friendly an interest in our success, as to induce him to give us the benefit of suggestions which he thinks calculated to make our efforts more acceptable and useful. We sincerely thank him for it, the more especially since we must, in reply, act on the defensive, and plead somewhat in justification of ourselves in regard to the manner in which we have conducted this journal. We think we have discovered under the disguise of "Laburnum" a gentleman

well known and distinguished in our community for his great courtesy and tender respect for the feelings of others, which so beautifully adorn the conduct and character of "the pefect gentleman." We know, therefore, that to such a friend we may speak with no fear that aught we say will be unprotected by the mantle of charity.

1st. We have thought always that the best way to serve the interests of our patrons, was to give them all the essays on Agriculture and its kindred subjects—from the pens of distinguished and practical farmers—that we could procure, *because* our journal, being "put up" in magazine form, is suitable for their preservation, and for reference to them at all times.

2nd. We have not hesitated to use our scissors freely, transferring to our columns any article, from any paper in any quarter of the globe, which we thought would benefit or interest our readers, and make them more zealous and active in the cause of farm improvement; in short: we have tried, to the best of our ability, "to improve the soil and the mind" of all those who were disposed to place themselves amongst "our readers."

For this cause we have been scolded, and told that if we did not give more of the experience of Virginians, we would not be supported.

We have been asked more than once in this connection, "What have we to do with England or English agriculture? What do we care for extracts from *other* papers?"

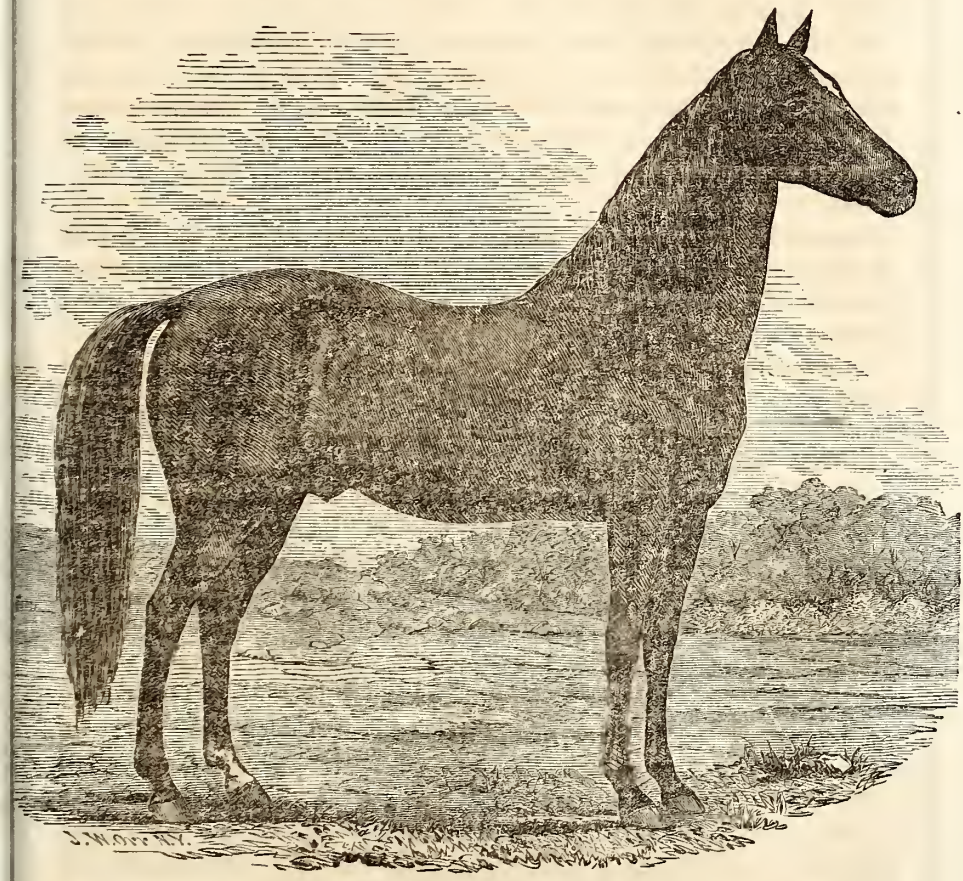
WE, in common with such complainants, *want communications from Virginia farmers.* We print what we can get, and *are always asking for more.* This fault and the remedy for it lie entirely in the hands of Virginia farmers. They "will not consider" and repent of the one, nor apply the other. But we hope they are waking up at last to a sense of the good they can do one another, and to poor begging Editors, and will begin to write, and aid us by all the means in their power in circulating everything "of good report" in agriculture.

3rd. We have been warned to print *nothing but strictly agricultural matter.* We run the gauntlet, and not unfrequently "catch it" on both sides—so that our correspondent will not fail to see that the *post of Editor, or any other servant of the Public,* is neither "a bed of roses," nor a sinecure.

It would give us the most unalloyed happiness to possess the power to "please everybody," could we exercise so desirable a charm without any sacrifice of duty or principle. We beg to assure all the friends of the "Planter," *particularly the old ones, who, like "Laburnum," have been steadfast and kind,* that we are always willing and ready to receive gratefully any suggestions of improvement, and to do everything in our power for their gratification and interest. All we ask is, that our faults may be considered (as they truly are) "errors of the head, and not of the heart." We desire the support of farmers everywhere—*from Virginians,* we think we have *almost a right to claim it.*

We will cheerfully attend to the requests of "Laburnum," and comply with his suggestions as far as is in our power.

This cut of "Black Hawk," although a good engraving, as a *drawing*, does not do justice the horse by any means. He is very far superior in appearance to his likeness, as here presented.



BLACK HAWK.

Black Hawk, (late Hardroad,) now the property of S. W. Ficklin, of Belmont, near Charlottesville, Va., was foaled the property of Col. Bela Howe, of Shoreham, Vermont; his dam was a raven black, by a colt of old Hamiltonian, owned by Isaac Bishop, of Granville, Vt.

Black Hawk was sired by Hill's famous Black Hawk, he by Sherman, and he by Justin Morgan; is now eleven years old, a glossy black, 15½ hands high, weighs 1,085 lbs., is perfection in form and power, his gait and style inspiring his appearance so much, it is difficult to believe him to be the horse the above cut represents.

He was trained but three weeks when six years old, and trotted in a race with "Sherman Morgan" or "North Horse," (his half brother,) over the Colchester track, near Burlington, Vt., making six heats of one mile each—trotting a mile in 2.44; and has been kept since only for stock purposes, and the last eighteen months as such by his present owner.

Agricultural Communications.

Since our connection with the Agricultural Press, we have not failed to beg the farmers of Virginia to write for our pages on any and every subject of interest to them, and we have often felt discouraged at the want of success attending our appeals. We hope a better condition of things is about to be inaugurated, and that we shall have very frequent essays, not only from *our* particular friends, but from *farmers* who are actuated both by the desire of improving themselves, and of doing good to others by imparting useful instruction, the result of their experience, or making hints for farm management or experiment, which may add variety and interest to our employments, and money to our incomes.

Farm Literature has been too much neglected in our own State, and if we can all communicate the results of our practice to one another, we shall doubtless find much of good to copy from others, and something to abandon in our own systems.

Again we ask every farmer who may read these lines, to determine at once to communicate either to our own, or to the paper of some brother Editor, any and everything connected with rural matters which he thinks may be useful or interesting to the rest of his craft.

The time has passed when any sensible man can be found willing to hazard a sneer at "book farming," as everything new and of a scientific nature used to be called. Agriculture has advanced with rapid strides during the last decade, and its useful progress has, in a great measure, been promoted by the number of good agricultural books and papers, which are scattered through the length and breadth of our country—by the discoveries and teachings of chemistry, and by the advice of many of our most energetic and public spirited "book farmers."

Depend upon it, in ten years more, the "Old Fogies" in farming will be left out of sight in our race of progress, and they deserve to be, as they are rapidly becoming, out of mind.

The sensible, scientific farmer is the only man who *can* keep up. Muscle alone won't bear us along in safety to success. We must have brains as well. We must be forewarned, to become forearmed against the ruinous errors of ignorance and prejudice; and there is no better way for us to place ourselves in such a position as farmers, than by careful study and experiment, and by frequent consultations with each other. We offer you a medium for such intercourse in the "*Southern Planter*," and will be happy if you will avail yourselves of it.

"A word to the wise is sufficient."

Piedmont Communication.

THE article which the reader finds in this number of the *Planter* from the pen of our correspondent, "PIEDMONT," contains the "seeds of things." With philosophical discernment and the pen of a ready writer, he traces out some of

the principal causes of the humiliating dependence of Virginia on the North for many of the most common necessaries and conveniences of life, while if we did but obey the impulses of patriotism and the dictates of sound policy, we should exclusively patronize the producers of such articles at home, as entitled to preference on account of the highly important relations they sustain to our national and social interests. We hope to hear from "PIEDMONT" frequently.

Dwarf Pear Trees.

We return our thanks to JAMES GUEST, ESQ., for a bundle of excellent Dwarf Pear Trees, to which we promise to devote our best attention. We take pleasure in commending the Nursery of Mr. GUEST to public notice, as he is in all respects reliable and skillful.

The Bee Journal

Is an excellent little volume, published monthly in Philadelphia, by the Editor of that valuable agricultural paper, *The Farmer and Gardener*. It is entirely devoted to the interests of those engaged in raising Bees and Honey; and it should be liberally encouraged by all persons who are interested on the subject, and who wish to improve their knowledge of the proper mode of managing Bees to the best advantage.

Catalogues Received.

Messrs. Barnes & Washburne's Flower and Vegetable Seeds. Harrison Square, Boston.

Bridgeman's Flower Seeds, with directions for culture and treatment. No. 876 and 878, Broadway, N. Y.

Affleck's Rural Almanac. Thos. Affleck, (near Brenham,) Washington County, Texas.

The Mutual Re-action Between Thought and Language.

Thought and language have ever been most intimately allied. If language, by its originality of structure, and its native richness, can, in its delineations, interpret thought with grace and clearness, and if, by its happy flexibility, it can paint with vivid truthfulness the objects of the external world, it re-acts at the same time upon thought, and animates it, as it were, with the breath of life. It is this mutual re-action which makes words more than mere signs and forms of thought; and the beneficent influence of a language is most strikingly manifested on its native soil, where it has sprung spontaneously from the minds of the people, whose character it embodies. Proud of a country that seeks to concentrate her strength in intellectual unity, the writer recalls with delight the advantages he enjoys in being permitted to express his thoughts in his native language; and truly happy is he, who, in attempting to give a lucid exposition of the great phenomena of the universe, is able to draw from the depths of a language, which through the free exercise of thought, and by the effusions of creative fancy, has for centuries past exercised so powerful an influence over the destinies of man.—*Humboldt's Cosmos.*

CONTENTS.

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