THE

SOUTHERN PLANTER.

Devoted to Agriculture, Horticulture, and the Household Arts.

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

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

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

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REPORT ON WHEAT-GROWING

TO THE LOCUST BOTTOM AGRICULTURAL CLUB,

(BOTETOURT.)

The committee appointed to investigate the subject of Wheat-growing, reported to the club the following views:

Wheat is said to be a native of Tartary and also "the Island of Sicily, where it grew spontaneously or without cultivation." The peculiarities of climate and the composition of the soils to which this important cereal is indigenous, would constitute a subject of interesting inquiry. The former, indeed, would be of practical advantage only so far as points of resemblance might be found to exist in our own climate, which we can neither change nor modify; but correct information in respect to the latter—the constitution of such soils,—would serve as an important auxiliary in prosecuting investigation respecting the necessary conditions of its healthful development and successful cultivation in this region. In the absence of such specific information, we are compelled to resort to that of a secondary character, and to depend mainly upon the uncertain light of experience, derived from observation of facts, illustrated or obscured as the case may be, by the greater or less attention given to particular circumstances attendant upon them. It is not surprising then, that diverse and conflicting opinions should prevail, when deduced from data so variable and uncertain, nor that the *system* of cultivation best adapted to secure to the Wheat-grower the largest production and the greatest profit, should still be enveloped in doubt and obscurity. It has been matter of common experience and general observation, that wheat does not require in the soil, so high a degree of fertility for its production as corn and tobacco; nevertheless, it must possess a peculiar adaptation of quality to its successful growth. The elementary constituents of the plant, especially the inorganic or mineral portions, must be present in the soil, or the absence of those ingredients of which it is deficient by natural constitution, or of which it has been deprived by exhaustion, must be artificially supplied. And here, we may felicitate ourselves, that although we are ignorant in some degree of the various elements and the precise proportion of each as they happily combine in the constitution of soils adapted to the spontaneous production of wheat, yet, we are not left wholly dependent on individual experience and observation, but derive important additional instruction from the light which the advancing science of chemistry is beginning to shed on the subject. By analysis we learn what are the elementary constituents of a good wheat soil, what amount of organic matter it contains, and in what proportion the different earths on which wheat is dependent for its supply of inorganic material are to be found. By a like process we learn what are the ingredients of which wheat is composed, and that a necessary condition of its favorable development is, that lime, soda, potash, clay, sand and phosphate of lime should mingle in proper proportions in the soil. We also learn by the concurrent testimony of science and experience in support of the same principles, that the condition of the soil should be such in regard to consistence, friability and temperature as by cultivation to render it most favorable to the absorption and retention of ammonia, and to its proper permeation by moisture and by solar and atmospheric influences.

Wheat has often been assailed by so many enemies, as to threaten at times its extinction among us. But by a wise ordination of Providence, it has been retained amidst every discouragement, and still constitutes one of the principal means of employment, through which man by "the sweat of his brow" is destined to earn bread. Long continued use has rendered this valuable cereal no less indispensable than agreeable as a *bread stuff*, otherwise it might have fallen a sacrifice to the parasite and innumerable other enemies which infest it, and the various other obstacles to its successful cultivation.

Corn and tobacco, being natural to our climate, seldom have to contend with disease; wheat, which is an exotic, would no doubt be comparatively exempt, if we could bring about artificially, what is essential to its natural development and spontaneous growth:—the nearer we may approximate that natural condition for wheat, the more complete will be our success. We may frequently take warning that all is not present in the composition of the soil, which is necessary, by the appearance of disease, or what we have been accustomed to regard as disease, but which in truth may be a want of condition to complete its growth.

Deep and thorough preparation favours the production of wheat. It has been ascertained that the roots will seek nourishment at the astonishing depth of four feet, and clay must be reached by the roots, in order to get the necessary supply of soda and potash. It is assumed that under favorable circumstances, a large growth of clover turned under, will insure a satisfactory crop of wheat; peas may be equally advantageous, both having many of the properties necessary to complete in our soil and climate a condition for wheat. Guano, having almost, in not all the properties essential to its production, (when applied in sufficient quantities, under favourable circumstances,) warrants the expectation of a satisfactory crop.

The time of preparation is of much consequence. It should be much in advance of sowing. The time of sowing too, is of still more consequence, if too early, it is apt to favour the development of its never-ceasing enemy, the fly,—if too late, your crop is thrown into the season for rust. Experience favours an early preparation, say from the 15th Juue till 1st of September, and the sowing from the 15th September, till 15th October, as promising of success.

MADISON GILMORE.
WM. E. WALKUP.
RICHD. G. HADEN.

This report was received, aud after being modified, as to the time of sowing wheat, by recommending that late wheat should be sown from the 1st to the 30th of September, and early wheats from the 15th September till 15th October, the secretary was directed to tender the report to the Editor of the Southern Planter for publication, as a contribution from the club to the cause of agriculture.

RICH'D G. HADEN, *Secretary.*

The following memorauda, taken from various sources and furnished by a friend, form an appropriate addendum to the above report.

ANALYSIS OF WHEAT.

Sprengal analyzed 100,000 parts of dry wheat, and obtained the following inorganic constituents:

Substances in the	*Grain.*	*Straw.*
Potash,	225	20
Soda,	240	29
Lime,	96	240
Magnesia,	690	32
Alumina,.	26	90
Silica,	400	2870
Sulphuric Acid,	50	37
Phosphoric Acid,	40	170
Chlorine,	10	30
	1717	3518

The organic portion of wheat consists of *Albumen*, *Gluten*, *Starch*, more than half *Gum Dextrine*, Sugar, &c.

THE TIME OF CUTTING WHEAT

Affects the weight of produce, as well as the quantity of organic matter, and the relative proportions of Flour and Brau. According to Johnston,

Wheat cut.	Days before ripe.	Yield of grain.
" "	20 " "	160 pounds
" "	10 " "	220 "
"	"*fully ripe* yielded	209 "

The yield of Flour and Bran were in the same proportion, in favor of that cut 10 days before ripe.

THE BEST WHEAT LANDS:

Are those which contain a good proportion of clay, with lime and potash.

Boussingault estimates "rich wheat land" to contain,

Clay	75 per cent.
Lime	4 "
Humus	11 "

As a *scourging* crop, wheat must be placed at the head of the list. According to *Boussingault*, a medium crop takes from one acre of laud, in grain and straw, of

Phosphoric Acid,	17	pounds.
Sulphuric do.	2	do.
Chlorine,	1	do.
Lime,	16	do.
Magnesia,	13	do.
Potash aud Soda,	24	do.
Silica,	121	do. all in the Straw, and 2 lbs. Oxides of Iron and Alumina.

Wheat requires a *dry* soil more than any other crop, except Barley. Wheat never known to "winter kill" and seldom to "rust" *on a dry* soil.

THE WASTE OF SEED.

Is very great in our common *broad-cast* mode of sowing. *Stephens* made this calculation, viz:

"Wheat at 63 lbs. to the bushel, gives 87 seeds to a drahm."

From various calculations of the *yield to an acre*, it would appear from Stephens' estimate above, that in the *best* crops, there is a loss of 33 per cent of the seed, and in an ordinary one (40 bushels !!) [in Eugland] 58 per cent. Seed wheat to be prepared by extracting all the small grains. Ground not to be too rough. Wheat not to be *covered up* more than two inches.

TOBACCO.

ITS CULTURE AND MANAGEMENT.

Read before, and published by order of the Liberty Neck Agricultural Club of Amelia County.

"Multum adhuc restat operis, multum que restabit, nec ulli nato, post mille sæcula præcluditur occasio aliquid adjiciendi."

The success of growing a crop of Tobacco, depending much upon early planting, the selection of such situations for plant-beds as will ensure a proper exposure to the sun, is all important. The eastern or southern slopes of hills, near their base, afford the best locations, the beds so situated being freer from sobbing, and the warmth of the sun greater than upon flat surfaces. Regard should also be had to the character of soil, it should be sufficieutly close to render it retentive of moisture, and yet contain sand euough to give it quickness: made earths, and other puffy soils are unfit, beiug both too arid and liable to heave. Having selected the bed, care should be taken to burn it: neither too wet, too dry, nor too hard, for if too wet it will bake, and if too dry the mould will be consumed. The latter objection also obtains to burning too hard. It is only necessary to burn sufficieutly to destroy the vitality of the seed and grass roots upon the land.

The bed having been burned, the ashes should be swept off aud the ground hoed up, observing to invert the soil as little as possible. The roots removed, and after raking guano at the rate of 500 or 600lbs. to the acre applied, hoed in, the bed again raked and the seed sown, an ordinary pipe bowlful to every 20 yards by 4 feet; tread and cover thickly with brush. The ashes should be cleanly removed, otherwise the action which will ensue between the lime, with which they are impregnated and the guano, will expel its ammonia.

To protect the plants from the depredation of the fly, sow air-slaked lime over the patch, and repeat the application if necessary. Upon removing the brush, which should be done towards the latter part of April, or early in May, the grass should be picked from the beds, and well rotted stable manure, which has beeu divested of its causticity, by having been spread and exposed to the air, applied.

The land having been deeply broken, should be well manured, replowed and reduced to a fiue tilth by dragging.

Lay off the rows six feet six inches apart, which when divided will give three feet three inches to each row, ridge with a double turning plough, and make the hills three feet three inches distant. The distance at which the tobacco is planted is of some consequence, for if too far apart, the loss in a crop will be considerable, while its value will be impaired by its coarseness, and if too thick, it will ripen irregularly, its lower leaves being too much excluded from air and sun to mature them.

Here allow me to digress, that I may speak of Peruvian guano, when used alone as a mauure for the tobacco crop.

From its earliest history, Virginia tobacco has ranked pre-emiuently high in the markets of the world, as well for its richness as delicacy of texture: now it stands but little better, if indeed as well, as the western. Why is this? Surely it cannot be attributed either to a change in our climate or soil. Is it not rather to be ascribed to the fact, that instead as formerly of growing it upon our Virginia soils, and improved lots, which from vegetable decomposition abound in those elements, which enter into the composition of the plant, large quantities are being raised upon soils from which those elements have been abstracted, solely with the aid of this fertilizer!

The rationale of guano growing large, poor, coarse tobacco, I conceive to be of easy solution. Such is the stimulus given the plants by this magic manure, that the absorbent vessels of its roots become so enlarged, as to take up and carry to i much larger quantity of sap than is natural; its sap vessels become engorged and disteuded to such a degree, that eveu the capillary vessels which are distributed over the surface of the leaf, are eularged; and while these vessels have to eliminate through the pores of the leaf a great deal of sap, but little is assimilated in consequeuce of the abseuce of those elements, which enter iuto the constitution of the plant, in the manure employed. Such tobacco must necessarily lose vastly in curing, while the sweating to which it is subjected during the evaporation of its sap, will give it a reddish color, with a rough and porous face.

The question might arise, whether or not guano should be dispensed with as a manure for the tobacco crop. I should say not. For by combining with it the Columbiau or other kinds of guano, rich in the phosphates, its defects may be iu a great measure supplied, aud although it can never be made to produce an article as desirable as that grown upon new lands aud improved lots—yet, with the increasing demand for this staple, and the impossibility of raising a sufficiency of putresceut manure to apply to the eutire crop, its use should be continued.

But to return: Hills enough for a planting beiug made, (the plants being large euough to bear transplanting,) cut them off and plant in the evening, there generally being sufficient season in them, when freshly prepared, to cause the plants to take root. A common error prevails of planting when the ground is too wet, especially upon stiff soils, as then the sticks with which the holes for the reception of the plants are made, compact the earth, and when dry a crust is formed almost impervious to their roots. Tobacco thus planted is also doubly liable to perish from the jar received at the first working.

CULTIVATION.

So soon as the tobacco has taken root sufficiently, and grown off, it should be ridged out,

the row should be loosened with the cultivator, and the hills scraped off to remove the grass. The next working should be given as soon as the plants begin to *spread the hill*, a foot coulter should be run sufficiently near the tobacco to check its growth, and a small hill put to it. This close ploughing, is especially necessary, if the tobacco shall have grown off rapidly, otherwise it will probably be of narrow leaf. It is even now necessary to attend to the worming. The last ploughing should be given just as the most forward plants are coming in to top, the earth should be thrown to the tobacco, with a turning plough, and a good hill made, observing so to divide the *step* as to allow the water to pass off freely. *Scraping up*, when required, completes the cultivation; in this operation, all loose earth should be drawn to the hill, and the row scraped down to a hard surface, to permit the water to pass off quickly. Firing may, (I am satisfied,) be guarded against to a considerable extent, by being careful never to disturb the roots of the tobacco after it comes into top, and by keeping the spaces between the hills divided, a d the row scraped up, to prevent sobbing. Plants, as well as animals, have their peculiar idiosyncrasy; for while some may be improved by continued working and excessive moisture, certain it is, that either corn or tobacco, are liable to fire, if their roots are disturbed about their period of fructification; nor is it to be wondered at since at this stage of their existence, when the greatest amount of support is required, the supply is cut off by severing their lateral roots, or by their decay.

The tobacco should be primed to about six inches. In topping, the most forward plants should be topped to twelve, the next to ten, and towards the middle of August to eight leaves, after which time fewer leaves should be left. The tobacco should be wormed and the suckers pulled off at least once a week, and should never be cut until entirely ripe, unless forced to do so from disease. The tobacco being cut and secured from sun-burning, should as soon as *fallen* be removed to the house, and not more than eight or ten plants put upon each stick, and the stics placed at least ten inches apart upon the tier poles. It should then be left until it has yellowed, when small fires made of dry old field piue, clear of lightwood, should be applied; the heat for the first two or three days should not exceed 100 degrees, about the third or fourth day it should be increased to 115 or 120 degrees, and kept up until the leaf becomes pretty dry. The fires should then be allowed to burn down, and when the leaf comes in order they are again applied, and kept up with increased heat until both leaf and stem are cured. Houseburning is frequently the result of allowing the stem to absorb from the leaf, when it is imperfectly cured. No further use of fires is necessary to *dry it out*, the only precaution required being to keep the floors of the barns covered with straw, to prevent the moisture from the ground affecting the tobacco upon the lower tiers. In stripping, the most experienced hands should assort the tobacco into first and second quality of lugs, and long and short leaf. The leaf should be neatly tied in bundles of six or eight leaves, taking care to keep each buudle as nearly as possible of the same length, and color. The lugs of both qualities should be prized and stripped, and the leaf carefully straightened, packed down and wrighted, but never allowed to remain longer than two or three weeks in bulk, otherwise it may have a rank smell imparted to it.

In hauging up, use small sticks about two and a half feet long, and sharpened at one end, to allow them to pass through the tobacco without opening it; press the tobacco pretty closely together to exclude air as much as possible, leaving a part of the house vacant to allow room for opening, when you wish to prepare for ordering it. In sticking, (the tobacco having been thoroughly dried out,) take it down, upon a warm south wind, so soon as it has come sufficiently to bear being moved without breaking, place it in a bulk upon the sticks and allow it to remain until it has softened somewhat from laying, then take it from the sticks, and after straightening, pack it down carefully in bulk for prizing, cover closely to exclude air. and weight heavily.

When about to prize, an experienced hand should be put at the bulk, assorting both short and long into two sorts, according to color and quality, for separate hogsheads. Of the operation of prizing, it is unnecessary for me to speak further than to remark, that fine tobacco should be packed, rather than prized, and that lugs and inferior leaf should be prized sufficiently hard to make hogsheads of good weight.

RICHARD F. TAYLOR.

For the Southern Planter.

F. G. RUFFIN, ESQ., RICHMOND, VA.

A Selection of Twelve of the most estimable varieties of Strawberries.

PRINCE'S MAGNATE, P, the largest variety yet produced in our country, rounded and some berries compressed, scarlet, rich flavor, productive, and highly valuable. A very showy berry for market, and a very remarkable and distinct fruit. Plant extremely hardy and vigorous, with large, broad, dark-green foliage. The leaves never burn during summer, nor are the plants ever injured by the winter.

PRINCE'S CLIMAX, P, very large, conical, beautiful bright scarlet, a splendid fruit, good flavor, very productive, estimable; plant vigorous, with pale-green foliage.

IMPERIAL SCARLET, P, second only in size to the two preceding, to which it is rather superior in flavor; the form obtuse, conical or rounded, scarlet, handsome and very showy, juicy and sprightly flavor, firm and well suited for market, productive; plant very vigorous, foliage pale-

green, very large and luxuriant, a remarkable variety, very valuable for the size and beauty of its fruit and for its other qualities. This, and the preceding variety, are of larger average size than Hovey's Seedling, and much superior in color and flavor, and consequently better suited for market.

Imperial Crimson, P, large, short cone or rounded, dark scarlet or crimson, fine color, sweet, fine flavor, productive, a first rate berry, fine for market. It is nearly as large as McAvoy's superior, and has the qualities for a market fruit in which that variety is so deficient.

Le-Baron, H, early, very large, obtuse cone, dark scarlet, not showy, sweet, rich, melting, highest flavor of all the large varieties, very productive for one of its sexuality, and continues long in successive bearing; foliage tall, light-green and very vigorous, a Seedling of the old Swainstone.

Suprema, P, very large, obtuse cone, bright light scarlet, a beautiful berry, juicy, sprightly, moderately sweet, very productive; foliage large and vigorous. A Seedling from the Montevideo or Chili, and precisely equivalent to obtaining a Pistillate variety from the British Queen.

Rosalind, P, very large, obovate, beautiful light scarlet, moderate but good flavor, very showy, scarcely prim enough for long carriage to market, very productive; plant vigorous, with large broad foliage.

Ejypse, P, early, large, conical, splendid fruit on long penduncles, and has the remarkable property of ripening all its berries at the same time, bright scarlet, high brilliant color, fine flavor with slight acidity. It is one of the greatest bearers of all Strawberries, and a full and profuse crop may be earlier supplied for the market from this variety than from any other. Plant vigorous, with large foliage. A very striking and remarkable variety.

Ladies' Pine, P, medium size, perfectly round, beautiful light scarlet, very sweet, highest and most exquisite flavor, productive; foliage dark-green, as if varnished, vigorous growth, with large fruit stems. This most estimable fruit will be deemed indispensable by every amateur who once tastes it.

Magnificent, P, very large, obtuse cone, light scarlet, good flavor, very productive, very valuable.

Diadem, P, very large and showy, rounded, beautiful light scarlet, pleasant flavor, a remarkably fine and beautiful berry; plant very robust, vigorous, and hardy, with tall light-green foliage, very productive. A Seedling of the Iowa.

Huntsman's Favorite, P, medium size, obtuse cone, bright scarlet, very handsome, sprightly, juicy, sweet, and very fine, productive, highly valuable. This variety was selected by Professor Huntsman from a bed of my Seedlings, and was named as above.

Crimson Perfumed, P, large obovate or rounded, crimson, sweet, juicy, high perfumed flavor when fully ripe, very productive, valuable; foliage dark-green.

Malvina, P, large, obovate, bright crimson, juicy, sprightly, good flavor, very productive. This variety greatly resembles Hovey's Seedling, its parent, both in the growth and foliage of the plant, and in the form of its fruit. But when contrasted it is rather smaller, with the advantage that the berries are of a more average size, and less unequal than that variety; the color is a brighter red, the berries more juicy, and of a more spirited and higher flavor, and it ripens fully a week or more before the Hovey, thus obviating the disadvantages of that variety. It is firm and well suited for market; foliage dark-green and luxuriant when in full growth. A grower who sent a considerable quantity to market the past season, contracted for the whole at 31 cents per quart. WM. R. PRINCE.

Flushing, N. Y.

JERUSALEM ARTICHOKE.

In reply to a request by the Editors of the Genesee Farmer, for the experience of its readers in the cultivation of Jerusalem Artichoke, we would say that we tried it twelve years ago, by inoculation with the mania which had then been imported from middle Tennessee. We grew it on a light and rich clay soil, upon a hillside—*not "side hill"*—well drained. We found it worthless compared to Indian corn for fodder, and inferior as a root-crop to turnips. When our hogs harvested them, they injured the land by rooting—a process, by the way, which does sometimes benefit old turf or sward bound lands, if not pushed to an extreme, and when we dug them by hand or with a plough, we found that the labour did not pay. We fed them awhile at the rate of half a bushel per day, with other suitable food, to two milch cows, and both had in consequence a laxity of bowels almost amounting to diarrhœa, and fell back in their milk.

We found that except on the richest portion of the land, at the foot of the hill, they did not assert their alleged supremacy over weeds, briars, and summer progress, which nearly divided the land with them; and the richer land could have been more profitably cultivated in something else.

Some of our neighbours who devoted a much larger area to the crop, thought they saved corn by turning their hogs on the lots; but we never could see that the order of the hogs was very fine: and in time they all gave out the cultivation. Possibly they may not have suited our habits; and we must consult the habits of the labourer almost as much as suitableness of climate and adaptability of soil, in whatever crop we grow, or wish to introduce.

It may be that in rich, sandy land, which hogs cannot hurt by rooting, or in places where labour is very cheap, this crop may succeed.

And Bouniegault, who, is stated in the Genesee Farmer's article to have given it a high name, may have met one or both of these conditions. Certainly we would not, in giving our experience, be understood as contradicting his, for he is the ablest, most practicable, and most reliable of all the great writers on Agricultural Chemistry that we know, more honest than Leibig, and far more so than Johnson. But the above facts comprize our experience in and observation of the culture of the Jerusalem Artichoke.

CHEMISTRY AS APPLIED TO AGRICULTURE.

At the present time there seems to be quite a difference of opinion among agricultural writers, as to the amount of service chemistry has rendered to the practical farmer.

The result has been produced by several causes. The honest zeal of too credulous parties, who, seeing the first results of the chemist's labor, hastily concluded and proclaimed to the world their conviction that the good time was rapidly approaching when science would do all the work of the farm, that the study of soils and vegetable physiology would soon enable a man to carry enough concentrated manure in his vest-pocket to manure a field.

There are many such over-sanguine men, and there is another class of men who stand ready at all times to take advantage of their credulity and coin it into money. If the man of science should make known to the farmer that the moon's rays had a beneficial and marked influence upon vegetation, this latter class of men would manufacture the concentrated extract of moonshine to meet the wants of the first.

The high expectations of the over-zealous, not being met by the slow advances of science, a reaction takes place in their minds, and they are carried to the other extreme, and denounce all science as humbug.

Another cause of the reaction is found in the fact that there exists a class of pseudo-scientific professors whose aim it is to take advantage of the willingness of farmers to believe that the revelations of science may be made directly available to them. These self-styled professors will, for a consideration, analyze a sample of a man's farm and write a prescription for the whole plantation by it, warranted to make it produce enormously.

These professors recommend young farmers to turn their attention to the study of chemistry, *at least so far as to be able to analyze soils and plants,* intimating that a mere superficial knowledge will enable them to do so. We have frequently seen the analysis, so called, made by such persons, and would much rather have the opinion of an old practical farmer who could neither read nor write, formed upon the bare inspection of a handful of soil, that one of these same analyses of it.

The truth is, there are but few chemists who are capable of making such an analysis of soils and plants as to be of any value. Organic chemistry is the most difficult branch of that science, and the inorganic constituents of plants are found in most soils in such minute portions, that none but a man endowed naturally with the requisite tact as well as a deep love of science, will ever become capable of making a reliable analysis, the minuteness and particularity of which would be incredible to the uninitiated, and the bare details of which few general readers would have patience simply to read.

The duplicity of speculators, the pretensions of unqualified men, and the reaction of the minds of the over-sanguine are the great drawbacks to the advancement of scientific agriculture.—*Louisville (Ky.) Journal.*

THE NEW STEAM FARMER.

I devoted two days to the examination of the operation of Boydell's Traction Steam-engine as a locomotive and tractive power, and have come to the conclusion that it is a "great success." This success is owing to the endless and wide railway attached to the circumference of the wheels, which gives a fulcrum for the lever, and a bearing sufficiently wide to carry a great weight on soft ground, without embedding in the soil. Hence the avoidance of friction and clogging. We might illustrate this by a sportsman on the mud oozes, whose feet would sink in, and thus render his power unavailable; but by attaching to his feet wide pieces of board, the pressure is diminished to a bearing condition. Thus, in the case of Mr. Boydell's machine, although it weighed nine tons, its impress was scarcely perceptible, where a horses' foot left a deep indentation. The engine walked from Camden-town to Acton, taking in tow its four-wheeled wagon, with coals, and four heavy iron ploughs, and water enough for four hours' work. When on the soft turnip-field—after a night's rain—it drew after it ploughs, scarifier, &c., with perfect ease, and then walked home again to Camden-town. It can ascend an acclivity of one in three, which is nearly walking up stairs, our stairs being one in two. It can back, advance; or stop instantaneously, the pinion being shifted from the cogs to the driving-wheel: and the power thus suddenly released is carried off by a separate fly-wheel, which may be used for driving thrashing-machines, mill-stones, or other purposes. In fact, instead of a farmer sending for and sending back a six horse-power engine and threshing machine,

requiring in each trip four horses, this machine will move itself anywhere—draw the corn to market, bring home manure, and do the cultivation and work of the farm.—The machine can turn as easily as a common wagon, and does not mind a deep furrow or a side-hill.—*Abridged from a letter from Mr. Mechi, of Tiptree Hall, in the Journal of the Society of Arts.*

Mass. Ploughman.

OLD ENGLAND AND NEW ENGLAND FARMING.

Messrs. Editors:—Young farmers and old ones do not always think alike. Not long since a young man made the remark that a farmer could not advance to wealth on a small scale at farming. We all know that; but very few at any kind of business do advance to wealth on any kind of a scale. At the west, where the land requires no manure, where one day's labor will produce more than three days work will here, the farmer well qualified for his business may operate upon a large scale to great advantage; but in those towns in New England which are remote from cities and large villages, to which I have particular allusions in this article, where the land requires hard labor and large quantities of manure to make it productive, it strikes me that farming on a "small scale" is most advantageous.

One obstacle to extensive farming in New England, is the difficulty of procuring good faithful laborers, and a greater one still is to raise produce enough to pay them their wages; and a third reason is, I have seen men in every town, of my acquaintance, who have tried the experiment on a large scale, enough to bankrupt the owners of the large farms and stock in trade, and reduce them to comparative poverty. What might be done on our average New England land on a large scale, under the argus eyes of such overseers as are employed in factories, is a question I cannot answer. Facts give more correct ideas than theories.—English farming is fascinating to amateur farmers in a newspaper. The improvements in draining, manuring and all others made by English farmers, who pay 20 cents a day for labor, are not easily imitated by our industrious, hard laboring farmers, who are necessitated to do their own work or pay from one dollar, the lowest price, to two dollars a day for labor, the year round. When we compare the price of English and Irish farm labor with labor in New England, who can expect to compete with English farmers who hire their laborers who board themselves for ten pence a day—less than half what board costs here besides wages? If New England farmers could have all their desired work done and improvements made on their farms by unrequited laborers, they might soon be ready to compare farms as well cultivated and improved as those of the mother country.

Farmers who do their own labor and support their families, cannot generally accumulate large capital to farm it on a large scale. I have seen several experiments tried in New England at a distance from the cities and large villages, at farming by proxy, and should be pleased to see one more. Let a farmer with a farm of any size, clear of debt, hire an overseer and laborers sufficient to perform the work, at the American price, and ten to one if he should not want assistance from government as much as the Steamship Navigation Company does, or be in a fair way to dispose of his farm in a short time, under the mallet. The man who is destined to live by farming in New England must oversee his own business, and every day's labor he does, will save him one or two dollars; there are exigencies in every farmer's case which require more help, and it is for his interest to hire; but English farming and American wages would not correspond in New England, and therefore he that would have farming conducted in English style, must have an income from some other source, if he would wish to keep his farm "free and clear of all incumbrances."—*Boston Cultivator.*

S. BROWN.

Wilmington, Aug., 1856.

From the Valley Farmer.

HINTS ON BUILDING.

The first matter to be attended to in the first story, is to have suitable strips ready to lay in the inside courses of bricks, at the proper height to which he nail the base or mop-board. Some wall in 3 by 4 scantling for this purpose, but a half inch strip 4 inches wide is all sufficient and even better, as a shrinkage is not material in a piece so thin. This should be laid on the bare bricks (no mortar) the same on top,

so that the strip shall answer in the stead of the joint mortar; to this strip the ground should be nailed of sufficient thickness to allow of a good coat of plastering, say 3-4 of an inch; the ground should be perfectly straight, as it is to guide the plasterers in putting on their mortar, as well as to receive the base. The plastering should extend to the floor that no opening be left behind the base.

Each room should have openings with registers both at top and bottom for ventilation. The idea that impure air was to be floating in the top of the room only, has been proved fallacious. Indeed, the most deleterious air is that which settles near the floor. By making the provision as advised, both may be disposed of. Such openings should communicate with the outer air by flues to the top of the house. The registers should of course be made to open and close readily.

The windows should be large so as to admit plenty of light, as well as air, when desired, and the upper as well as the lower sash should be made to slide, either by weights and cords (which are best) or by sash locks, springs, or some of the insny methods attaining the desired end.

Let your stories be high. Remember you are building a house to *live* in, and not one in which you design to murder yourself and family by piece-meals, by the administration of impure air. Consequently you want your stories high, not less than nine or ten feet in any case. The idea entertained by some that a chamber ceiling should not be so high as a parlor ceiling is erroneous, for at no time, probably, is pure and fresh air more indispensable than during the hours of sleep. Hence we would advise high ceilings throughout. One can readily imagine the baneful influence of breathing over and over again the air already charged with the impurities of the system; but remember, such must be the case when low ceilings are adopted. And only think, too, how little extra expense it is to make your rooms higher. The same joists, flooring, lathing and plastering, windows, doors, everything, except the narrow belt around the tops of the room, which would probably not exceed 5 per cent additional cost. How little, for so much.

Care should be taken to have no vacant space behind the base board, for as sure as such space is left, it will very soon be appropriated by unwelcome tenants. Let no holes be left. The best support for the hearths is a brick arch, on which fill up to the proper height with bricks and mortar (solid) and lay the hearth in mortar; by this means those inveterate pests, the mice, will be effectually and permanently excluded from their almost universal hiding place.

Your flues should be sufficiently large, ranging, of course, with the volume of smoke to be disposed of; 9 by 12 inches inside will be sufficient for a stove or grate, and for an open fireplace 12 inches each way. Flues should always be smoothly plastered inside, by which means chimneys which would otherwise smoke will be made to draw. By mixing a liberal amount of salt with common lime and sand mortar, and plastering the flues with the composition, you will obviate the necessity of cleaning your chimneys or burning them out, as is practiced by some persons, thereby laying themselves liable to have their houses fired on some subsequent burning out of the chimney. It is seldom the case that more or leess damage is not done by bursting the chimney from the sudden and excessive heat generated on such occasions. When the salt is used it will be found that the soot accumulated during dry weather will be shed on the return of wet or damp weather, and the chimney left clean. If you would secure a good draft, you should in all cases carry the chimney above the peak of the roof, and remember that every additional foot in height will increase the draft. The rule to insure a draft is to give the flue about one half additional capactty more than the throat at the gate or fireplace. W.

TO MAKE PURE WINE OF APPLES.

Being aware that much wine sold for genuine champaigne was manufactured from cider, we informed a correspondent a short time since of this fact in answer to his inquiry. The following letter was elicited by the reading of the answer referred to:

MESSRS. EDITORS—I am well aware that imitation wines are now extensively made in the State of New-Jersey from the juice of the apple, and more from the Harrison apple than from any other variety, and the most of it is made at Newark. Those *knowing* ones are correct with regard

to its being a mixture of poisonous drugs not fit for the human stomach.

Having been in the horticultural business for over forty years I have had an eye single to those spurious wines from the juice of the apple.

It is gratifying to me to think that when you come to taste and test my wine—which I send you accompanying this letter—you will find a wine, a pure article, free from all drugs, and not an imitation. The sample I send you is eighteen months old, and made after the following process:

Take pure cider made from sound ripe apples as it runs from the press. Put 60 pounds of common brown sugar into 15 gallons of the cider and let it dissolve, then put the mixture into a clean barrel, and fill the barrel up to within two gallons of being full with clean cider; put the cask in a cool place, leaving the bung out for 48 hours; then put in the bung, with a small vent, until fermentation wholly ceases, and hung up tight, and in one year the wine will be fit for use. This wine requires no racking, the longer it stands upon the lees the better. STERNE BRONSON. *Elkhart, Ind., April*, 1856.

It will be observed that our correspondent has, for the benefit of all concerned, described the method of making pure cider wine, and it is for us to say something regarding the sample he sent us. It is a good cider wine, the best we ever tasted. If it had any fault, it consisted in being a very little too sweet. This can be remedied by using less sugar than the above named amount. A barrel of cider contains 31 gallons. Wine from currants can be made in the manner exactly.—*Scientific American.*

BROWN BREAD—ITS HEALTHFULNESS AND ECONOMY.

In these days of dyspepsia and high prices, the subject we have chosen will not be untimely. About every other man we meet, is troubled with indigestion, in some form, and nearly all complain of the high price of flour and other provisions.—Complain, and yet throw half of their flour away! Dou you ask, "how so?" They do it by refusing to eat anything but superfine flour. To manufacture such flour, wheat must first be ground fine, then bolted through fine seives, as though the bran was useless or unfit for human food. In all this, man assumes to be wiser than his Maker. Why did God so firmly unite the covering of the grain to the inner part?—so firmly that man has had to tax his ingenuity to seperate them. In interfering with this original and divine arrangement, man pays the penalty in dyspepsia and a great loss of general stamina.

Does the reader doubt the truth of our position? Well, let us see. Science can analyze our bodies and see what they are made of, and what they need to keep up repairs. It also can analyze wheat, and find what it can do towards building up our bodies. Such analysis shows that whole meal flour is more flourishing, as well as more wholesome, than fine white flour. The solid parts of our bodies are composed, principally, of bone, fat and muscle. These are continually wasting, and must be supplied from some quarter, or we die. The fluid parts contain the same substances in a liquid form, on their way to or from the several parts of the body where required. They also contain a little salt. The various articles of food in common use, contain these elements in a greater or less proportion. For the present, we will speak only of wheat, which contains them in a large measure. How, then, stands the case between brown bread and white?

According to Prof. Johnson, (high authority in chemical analysis,) of fat-making material, a thousand pounds of

Whole grain contain	- - -	28 lbs.
Fine flour	" - -	20 "
Bran	" - - -	60 "

So, for building up *this* part of the body, (a not unimportant one in some of our jolly readers!) bran is better than the inner part of the grain, and the whole grain ground together, and used as "Graham flour" is richer than the finer part alone by nearly one-half.

Of muscle, or flesh-making material, whole grain furnishes 156 lbs. in 1000; fine flour furnishes 130 in 1000. So it appears that wheat all ground together furnishes one fifth more muscle than fine flour.

Of bone material and saline matter, a thousand pounds of whole meal and fine flour contain respectively—

Whole meal,	- - - -	170 lbs.
Fine flour,	- - - -	67 "

So that for this part of our constitution, whole meal is nearly three times as nour-

ishing as fine flour. It is a clear case, then, that in these essential elements of nutrition brown flour is richer than white flour. And if we eat for the sake of sustaining health and strength, why should we not choose brown flour? If we cling to the white flour, because it pleases the eye and palate more, we waste a great deal of most excellent food, and diminish our strength and health.

Does the reader say that this is all mere theory, and that he must have facts, the results of actual trial, before he will admit the theory. He has facts, plenty of them. Why does the physician recommend brown bread, cracked wheat, and the like forms of food to invalids with impoverished constitutions. What more than his oatmeal, makes the Scotchman so hearty? Experience shows that the mixture of ingredients just as they are found in the natural seed, are what the animal frame needs. The experiment has been tried, of feeding animals exclusively on fine flour; and it was found that they could live only a few weeks. Fed on coarse flour, they lived much longer. Animals will fatten on bran alone. And every man who has tried it faithfully, knows that brown flour promotes his digestion and general vigor, while "extra superfine" white flour impairs both. And as to the economy of the thing, we have seen an estimate, which seemed to us correct, that "the wheat of this country would, in this form, go one-fourth further than at present."

Have we a dyspeptic among our readers? We then beseech him to eschew medicine, and to chew brown bread? Have we mothers? We beseech them, if they would impart strong constitutions to their offspring, to use brown flour, and to teach their growing children to use it. Have we poor men? We advise them not to throw away an important part of their grain. Have we healthy men? As they value the preservation of their health, we beg them to use wheat flour just as God made it, and designed it to be used.—*Rural American.*

BLACKING FOR HARNESS.

Melt four ounces of mutton suet with twelve ounces of beeswax; add twelve ounces of sugar candy, four ounces of soft soap dissolved in water, and two ounces of indigo finely powdered. When melted and well mixed, add half a pint of turpentine. Lay it on the harness with a sponge, and polish off with a brush.

Here is another recipe:—Take three sticks of the best black sealing-wax, dissolved in half a pint of spirits of wine; to be kept in a glass bottle, and well shaken previous to use. Applied with a soft sponge.

Another recipe for black varnish is the following: Best sealing-wax, half an ounce; rectified spirits of wine, two ounces; powder the sealing-wax, and put it in with the spirits of wine, into a four ounce phial; digest them in a sand heat or near the fire, till dissolved. Lay it on warm with a fine hair brush. Spirits of turpentine may be used instead of spirits of wine.

TOBACCO AND HOP CULTURE IN MASSACHUSETTS.

It appears from the returns as published in the Industry of Massachusetts, by the Secretary of State, that the following Counties are engaged in the hop culture:

Berkshire Co.	crop,	valued at	$324.00
Essex	"	"	0.80
Franklin	"	"	10,302.50
Hampshire	"	"	480.00
Middlesex	"	"	21,625.00
Norfolk	"	"	10.00
Worcester	"	"	14,719.36
Aggregate of hop culture,			$47,461.66

Tobacco Culture in Massachusetts.

Berkshire Co.	crop	valued at	$250.00
Franklin	"	"	12,403.00
Hampden	"	"	21,220.70
Hampshire	"	"	23,600.00
Total,			$57,673.00

According to the returns of 1845, the hop culture shows the following result:

Berkshire Co.,	value of,		$188.00
Essex	"	"	49.00
Franklin	"	"	4,814.00
Hampshire	"	"	311.00
Hampden	"	"	13.00
Middlesex	"	"	17,800.00
Worcester	"	"	9,071.00
Total,			$32,246.00

Increase in favor of the last return,	$15,215.66
Tobacco, according to the same returns:	
Berkshire Co., value of,	$25:00
Franklin " "	544.00
Hampden " "	11,953 00
Hamshire " "	4,182.00
Total,	$16,704.00
Showing an increase in favor of last returns, of	$15,542.00

Thus is presented the aggregate amount of hops and tobacco growing in the State since 1837, when Secretary Bigelow's report on the Industry of Massachusetts was published. There are those who look upon the cultivation of hops and tobacco as immoral, and should therefore be abandoned by all honest, upright and good men. Without touching this point, it is undoubtably true, that those who understand the art of cultivating these farm products and have land suitable, find it a very profitable business. Hence, the motive for their culture. It will be found to be generally true, also, that the majority of those who engage in farming, have an eye on the profits, accruing from the labor and money invested, not that all pursue the most direct course to reach the desired end. This is because they do not understand the great science of Rural Economy, which should be the daily study and meditation of every farmer. This would soon remove the prejudice against "book farming," for books, like experience and observation, may be the medium of conveying valuable truth to the mind.—*Massachusetts Ploughman.*

RURAL OBSERVER.

A CURIOUS QUESTION.

It is a singular illustration of the inexactness of agricultural knowledge, that the question how many seeds there are in the pound of our commonly cultivated field plants, should still remain to be answered. It is plain that the answer will not necessarily affect farm practice—for the quantity of seed which it is proper to sow per acre, is a matter to be determined by experience, not by argument apart from trial; and yet surely it is most desirable to compare the number of the seeds we ordinarily sow with that of the plants we raise. If in ordinary practice, 1,200,00 seeds of wheat are sown on every 40,000 superficial feet, or what is more extraordinary, fifteen to eighteen million seeds of flax are scattered on the same extent, about three to every inch of land, it is surely well to let the farmer know it. He knows very well he does not raise so many plants as this—and struck, as he must be, by the enormous disproportion between the means he uses and the result he gets, he will inquire into its causes.

The turnip seed employed per acre, numbers from 600,000 to 1,000,000, according to the kind and quantity adopted; this, if the rows are two feet apart, is two or three dozen seeds per foot of row, where a single plant alone is to be grown. No doubt nothing like so many generally come up, but then there is a great destruction by the hoe, which will explain much of the discrepancy in this case. What, however, becomes of the 18,000,000 seeds of flax which are commonly—of the 6,000,000 seeds of oats which are sometimes sown per acre? There is no destruction by the hoe in either instance here. A single ear of oats may contain 100 grains—a single plant will generally include half a dozen ears, but if 6,000.000 plants should yield as much as this implies, they would produce 100 loads of grain. Instead of 600 seeds a piece, they yield but half a dozen each to produce an ordinary crop of oats. It is plain that five-sixths of the seed, or of the plants that they produce, are killed in the cultivation of the crop; and the proportion is vastly greater than this in the case of other plants. What is the ordinary seeding of the clover crop? Eight pounds of red clover, four of white clover, and four of trefoil may be sown—that is at least 6,000,000 seeds per acre—a seed on every inch of land—but instead of 144 are there generally half a dozen plants on every square foot of the clover field?

There are about 25,000 seeds of sainfoin in a pound of 'rough' seed, as it is called, and it weighs some 20 lbs. per bushel; four bushels is an ordinary seeding, and they contain 2,000,000 seeds, or 50 per square foot of land. This is the number, too, of seeds in an ordinary seeding of vetches. This is the number, too, of seeds in an ordinary seeding of vetches. It is manifest that in both these cases there is an enormous destruction either of young plants or seed; and these are the two great divisions under which the causes of this

anomaly must be classed: faults of seed and sowing, and faults of cultivation. We are enabled, by the assistance of Messrs. Rendle, of Plymouth, to lay before them the following answers to the question—how many seeds to the pound?

Name	No. of seeds per lb.	No. of lbs. per bush.
Wheat,	10,500	58 to 64
Barley,	15,400	48 to 56
Oats,	20,000	38 to 42
Rye,	23,000	56 to 60
Canary grass,	54,000	
Buckwheat,	25,000	48 to 50
Turnip (Rendle's Swede),	155,000	50 to 56
" (Cornish Holdfast),	239,000	"
" (Orange Jelly),	233,000	"
Cabbage (Scotch Drumhead),	128,000	56
" (Drumhead Savoy),	117,000	50 to 56
Clover (Red),	249,000	60
" (White),	686,400	59 to 62
Rye grass (Perennial).	314,000	20 to 28
" (Italian),	272,000	13 to 18
Sweet Vernal Grass,	923,200	8

[*Scotch Paper.*

CULTIVATION OF WINTER WHEAT.

No soil can produce wheat unless it contains, in an available condition, all the inorganic elements of plants. It does not follow, however, that if these are present in sufficient quantity, the soil will produce good wheat. Indian corn is composed of precisely the same elements as wheat, and the proportions are nearly identical. Yet we have much land that produces excellent corn, that is not adapted to wheat culture. We know so little in regard to the manurial requirements of Indian corn, that we can offer no chemical explanations of this fact. We know that wheat requires in the soil, a large quantity of ammonia, for the production of a good crop; and nearly every well established fact in regard to corn culture goes to show that the same is true of this crop. We come to the conclusion therefore, that while it is probable there are some chemical causes why one soil is better adapted to wheat culture than another, yet that, so far as we can see at present, the difference is owing principally to the mechanical conditions and texture of the soil.

Wheat delights in a compact, calcareous loam, rather clayey than sandy. We have heard farmers say that they preferred a sandy to a clayey soil for wheat, but this opinion arises from the fact that most of our clay land needs underdraining. A calcareous clay that is underdrained, or naturally dry, is better for wheat than a sandy soil under similar conditions. Why it is, we know in part;—the double silicate of alumina and soda parts with its soda and absorbs ammonia from rain water, the atmosphere, and from any other bodies containing it. Sand does not possess this property; and herein lies one reason why a clay soil is better for wheat than a sandy one. Clays, too, have the power of absorbing and retaining moisture to a much greater extent than sand. But we can overcome both these drawbacks by an extensive cultivation of clover, peas, turnips, &c., on the sandy soils. These plants absorb ammonia from rain water and the atmosphere, and thus accomplish the same end as the double silicate of alumina and soda, while the carbonaceous products arising from their decomposition in the soil give the soil an increased capacity for absorbing and retaining moisture. These considerations lead to the conclusion that the farmer has the means in his power to make a sandy soil as good for wheat-growing purposes as a clayey one, in every respect, so far as we can see to the contrary with the little light we possess on this subject, except in its mechanical condition.

As we have said, a wheat soil must be compact. If it is not so naturally, mechanical means should be employed to compress it. Treading light wheat land in the fall or early in the spring with sheep, is frequently beneficial and a good heavy roller is decidedly advantageous. Crosskill's Clod Crusher, a cut of which will be found on another page, compressing land, as it does, similarly to the treading of sheep, is found very useful on sandy wheat fields in England. We are earnest advocates of deep plowing and thorough pulverization of the soil, but these must not be carried to excess in wheat culture. It is easy to make the light land too fine and loose for wheat. When wheat is sown on a clover sod after one plowing, it is not advisable to plow it too deep; if the sod is all covered and a good "seed bed" obtained that is enough. Subsoil and plow deep for corn and root crops, and if you summer fallow, for wheat also, but if wheat is sown at one furrow on a clover sod turned under immediately before seeding, we should seldom go more than six inches

deep. The best large field of wheat we ever saw in England, was on a calcareous loam that had been two years in red clover, grazed with sheep, which, a considerable portion of the time, were allowed a lb. of oil-cake a day. It was plowed about three inches deep, just before sowing, and a bushel and a half of seed drilled in per acre, one foot apart in the drills. This yield was 55 bushels per acre.

The question of thick or thin sowing, so fiercely agitated in Egland a few years ago, by DAVIS, MECHI, HUXTABLE, and other ultra agricultural reformers, is now pretty much decided. A peck of seed to the acre is amply sufficient, as they contended, if it all grows, and the crop escapes wire-worms, winter-kill, &c; but it is found that those who practice such extreme thin seeding always lose more from these causes than those who sow thicker, and that these losses more than counterbalance the gain from saving a bushel or two of seed per acre. Taking into consideration the many pests that infest our wheat crop, we are inclined to think, that if anything, we sow too thin. Two bushels per acre is none too much when sown broadcast, or a bushel and three pecks when sown by the drill. The majority of English farmers sow three bushels per acre, and we know some of them who sow 3½ and even 4 bushels per acre. This would be greatly too much in our climate; but we must not err in the other direction.

The best artificial fertilizer for wheat is unquestionably Peruvian guano. The lumps of the guano should first be sifted out and crushed. It can then be mixed with muck in equal parts, or sown alone, broadcast, at the rate of from 200 lbs. to 400 lbs. per acre. It should be harrowed or cultivated in, thoroughly incorporating it with the soil, before sowing the seed. This we prefer; on every sandy soil, it might be advisable to sow 100 lbs. per acre in the fall after the wheat is sown, and another 100 lbs. early in the spring. On heavy land it should always be sown in the fall, and the longer it is incorporated with the soil before the seed is sown the better. The earth is a stomach in which food for plants is digested and prepared; and time should be allowed for it to accomplish this before the plants require nourishment. On light soils, however, there is danger of its leaching if sown too early; and there is less necessity for doing so, as from the admission of air, light and heat, chemical changes take place much more speedily in sandy soils than in those of a close texture.

Plaster is frequently recommended for wheat, and there are many instances recorded where it has proved very beneficial. but the mass of testimony is against it. In the wheat growing districts of this State, it is frequently sown on wheat in the fall; but it is rather with an eye to its effect on the clover, to be sown the following spring, than to any action it has on the wheat. Many will object to this, and contend that plaster does good on wheat. To this we would say, that if plaster acts well as manure for wheat on your land, by all means use it. When it sells from $2 to $5 per ton, as in Western New York, it is the cheapest of fertilizers on all soils where experience shows it to be beneficial. At present, experience—or what is simply a short cut to experience, experiment—is the only guide in this matter. The same may be said in regard to salt as a manure, Many instances are recorded where it has had a magical effect. Some such have come under our observation. As a general rule, however, salt is of little benefit on wheat. Prof. WAY suggests that salt acts by increasing the solubility of the silicate of alumina and ammonia. Water containing salt will take up a very much larger quantity of this salt than pure or ordinary rain water. He has expressed the opinion that the silica which forms the stiffening of the straw of wheat, is taken up by the plant in the form of this salt—the ammonia evaporating as the silicic acid is deposited on the straw. If this ingenious hypothesis proves correct, we have at once an explanation of the well known fact that salt stiffens the straw of wheat, and has a tendency to retard excessive and injurious luxuriance. We would say of salt, as of plaster, it is cheap, and every farmer should experiment and ascertain its effect on his own soil. Analysis, in the present state of chemical science, will not aid, though when this subject is better understood, it is highly probable that it may prove useful.—*Genesee Farmer.*

The wheat crop of Wisconsin is stated at 14,000,000 bushels. It never was so good before, but this is probably too large an estimate.

INTERESTING FACTS ABOUT HORSES.

During the last winter, Dr. Waterbury, as Chairman of a Committee appointed by the New York Farmers' Club, made a valuable report on the management of horses and mules employed by various companies in New York. From a portion of the report published in the American Agriculturist, we take the following. The facts are all important, but none of them more so than those showing objections to *large* horses for the kind of work mentioned.—*Boston Cultivator.*

The amount and kind of food consumed by animals depends on the amount and kind of labor they perform. Fattening animals are generally fed differently from working animals. Species and age make marked differences in the kind of food required by the same habits, climate and season of the year also, to a certain extent. Exercise produces, with animals, both an increased consumption of food and an increase in weight. Beyond this point there is increased consumption of food, but a diminution in weight to a second limit, beyond which both are diminished, and the animal is "used up."

The Committee have received returns from the following stage lines in this city, as shown in the accompanying table:

STAGE LINES.	Number of Animals.	Miles of daily travel.	Lbs. cut hay daily fed.	Lbs. corn meal daily.	Increase of meal for the recent severe term of traveling.
Red Bird Stage Line,	116	17	14	18	3 1-2
Spring Street Stage Line,	106	21	14	20	3 1-7
Seventh Avenue Stage Line,	227	22	10	18½	2 1-2
Sixth Avenue R. R.—Horses,	117	17	10	14	
Mules,	211	17	10	7	
New York Consolidated Stage Company,	335	21½	8	17	2 1-2
Washington Stables, six livery horses,			12	*7⅛	

It is the object of the stage proprietors to get all the work out of their teams possible, without injury to the animals. Where the routes are shorter the horses consequently make more trips, so that the different amounts and proportions of food consumed are not so apparent when the comparison is made between the different lines, as when it is made with the railroad and livery horses. The stage horses consume most and the livery horses least.

The stage horses are fed on cut hay and corn meal, wet and mixed in the proportion of about one pound of hay to two pounds of meal—a ratio adopted rather for mechanical than physiological reasons, as this is all the meal that can be made to adhere to the hay. The animals eat this mixture from a deep manger.

The New York Consolidated Stage Company use but a very small quantity of salt. They think it causes horses to urinate too freely. They find horses do not eat so much when worked too hard. The large horses eat more than the small ones. Prefer a horse of 1000 to 1100 pounds weight. If too small, they get poor and cannot draw a stage. If too large, they ruin their feet, and their shoulders grow stiff and shrink. The principal objection to large horses, is not so much the increased amount of food required, as the fact that they are soon used up by wear. They would prefer for feed a mixture of half corn and half oats, if it were not more expensive.

Horses do not keep fat so well on oats alone, if at hard labor, as on corn meal or a mixture of the two.

Straw is the best for bedding. If salt hay is used they eat it, as not more than a bag of 200 pounds of salt is used in three months. Glauber salts is allowed occasionally as a laxative in the spring of the year, and they eat it voraciously. If corn is too new it is mixed with half rye bran, which prevents scouring. Jersey yellow corn is best; horses like it the best. They cut all the hay, and mix it with meal and feed it wet. No difference is made between day and night work. The travel is continuous, except in warm weather, when it is sometimes divided and an interval of rest allowed. In cold weather the horses are watered four times a-day in the stables, and not at all on the road; in warm weather, four times a-day in the stables, and are allowed a sip on the middle of the route. The amount that the Company exact of each horse is all that he can do. In the worst of the travelling, they fed 450 bags per week of meal, of 100 pounds each. They now feed 400. The horses are not allowed to drink when warm. If allowed to do so, it founders them. In warm weather a bed of saw dust is prepared for them to roll in. Number of horses, 335. Speed varies, but is about four miles an hour. Horses eat more in cold weather than in warm, but the difference cannot be exactly determined. The Company are deadly opposed to the Russ pavement; had rather have cobble stone.

Corn meal should never be ground very fine, it injures the richness of it.

Communications to the Virginia State Agricultural Society.

A MEMOIR ON THE SUMMER DISTEMPER OF COWS, AND OXEN.

BY JOHN P. METTAUER, M. D.

This fatal disease has prevailed time immemorial with the bovine genus of animals, especially cows and oxen, during dry, hot summers, nearly in every part of Virginia as well as in North Carolina along its northern border. It was, in the early recollection of the writer, believed by many persons, to have been brought into Virginia from the "Old North State," by cattle affected with the disease; and was, consequently, denominated the Carolina Distemper. Even at the present time, many farmers and house-keepers, are firmly persuaded, that it is of Carolina origin, and a very infectious disease with cattle. With milch-cows and oxen, it has often prevailed, in many portions of Virginia, extensively and fatally, having been known frequently, to destroy every grown cow and work-ox in certain situations and neighbourhoods.

The disease has been variously denominated Carolina Distemper; Summer Distemper; Cow Distemper; Ailment of Cows; Staggers; and Bloody Murrain. As, already intimated, it is peculiar to warm dry summers, having rarely, if ever been witnessed as a prevailing disease during wet, or very seasonable years. July. August, and September are the months in which it usually prevails; but it may appear earlier or later, if the season is warm and dry for some weeks continuously. The writer has witnessed it in May and June when the spring set in early, attended with warm dry weather. And he has known it to prevail as late as October and November, when these months were very warm and dry after a seasonable summer.

Stock that range upon the commons, or exhausted lands affording little herbage, and badly supplied with pure water, are most liable to the disease. While those that are kept in enclosed pastures well watered, and abounding in luxuriant healthy herbage, and not much crowded, seldom have it. There is good reason to believe, however, that the disease prevails most extensively when the stock of different neighbourhoods are permitted to graze together upon old commons, badly supplied with fresh running water; and that have been trampled over, and almost covered with excrement, and the soil in a degree saturated with urine and the fluid parts of the excrement for many weeks in succession.

There is good reason to suspect that sickly fever-summers with man, are favorable to the appearance of the disease in question, with cattle. During the years 1806, 1816, and down to 1827, which were years of fever, the distemper with cattle prevailed more extensively, and fatally in many parts of Virginia, than it has ever been known to do since.

The causes of the disease have never yet been satisfactorily ascertained. It is true many conjectures, in explanation of them, have been advanced; but as yet they remain hidden, and unknown. Contagion, or infection has generally been regarded as the cause of this disease; but no satisfactory, or philosophical explanation has been given of the origin or source of the supposed contagion. The doctrine of contagion, in explaining the causation of this disease, is not satisfactory, nor is it tenable, as all enlightened medical men, who have carefully examined the subject, must unhesitatingly admit, and they are the only persons competent to examine, and decide in the matter. My own opinion is adverse to the doctrine of contagion, as I advocate the malarial causation and origin of the disease; and this view is deduced from ascertained facts bearing on the subject, and from conjecture, next to be considered.

It is clearly established, that the disease under consideration, does not originate at any other period of the year, but that characterized by hot dry weather, and when pastures have become dry, exhausted; and their herbage either dried up, or in a state of decomposition. It is also well known that cattle are less liable to the disease, when kept in pastures that afford an abundant supply of luxuriant herbage for grazing, and pure running water, than those permitted to roam at large over dry commons, or even enclosed pastures, that afford little healthy herbage, and are badly supplied with pure running water. Experience also establishes the fact, that the disease seldom, if it ever, makes its appearance during summers that are unduly wet throughout; or, that are distinguished by frequent transitions of humidity of the

atmosphere, constituting a seasonable summer.

The disease itself is a peculiar affection, and its symptoms, as well as morbid anatomy, closely resemble, in some respects, those of certain malarial fevers incident to man: it also resembles some of those diseases by rendering the constitution insusceptible to second attacks. The writer, out of numerous recoveries, has never yet known an instance of second attack of cow-distemper; and cattle, by reason of such insusceptibility, are always greatly enhanced in value if they recover from the disease.

The mode of attack, as well as the predominant symptoms of the disease, much resemble similar phenomena incident to the malarial fevers of man, more especially continued fevers, of which there are several varieties.

The post mortem appearances, as well as the organs chiefly implicated, too, are very similar; nay they are identical in many instances, with those met with in fatal examples of the malarial fevers of man, making allowance for such diversity of organization, both of structure and function, as necessarily distinguishes man from cows and oxen.

These facts are well established by observation and experience, and form an interesting and important series, touching the history and origin of the disease under examination. But in their application it will be necessary to invoke a speculative, or conjectural mode of reasoning, to show their bearing fully, in explaining the origin and cause of the disease in question.

The disease, I believe, to be a form of malarial fever, involving the stomach and intestines, as in similar fevers of man, as the local affections; and, that unsound grass, or other herbage taken into the stomach as food; or malaria, exhaled from those substances, while cattle graze, and inhaled into the air-passages of the lungs during respiration is its cause. That this disease is a form of fever, in many respects resembling some of the febrile diseases of man, can hardly be questioned; as its morbid anatomy, and the organs constituting its local affections are nearly identical with those of the fevers of man. It begins, too, as the fevers of man usually do, with the premonitory dullness, disinclination for exertion, food; and, in most cases, there is a disposition to leave the herd and seek a place of solitude. Sooner or later the animal becomes drawn up, as if chilly, and if carefully examined, by feeling its body with the hand, it can be discovered that the surface is decidedly cooler than natural, and that there are, in many instances, tremors of the thighs, such as are to be observed with cattle in cold wet weather, but less strikingly manifested, indicating the presence of a chill. This state is soon followed by increased warmth of the surface, giving evidence of febrile reaction, and the development of a regular paroxysm of fever. Now it is that the eyes become red, and frequently watery, and wild; the hair is dry and wooly, as if it had been raised by rubbing it the wrong way; the animal becomes restless, frequently changing its situation in the pasture, and disposed to wander in the direction of streams, or ponds in the pursuit of water, which if reached it leaves reluctantly; and where, the poor animal has been known in some instances, to "drink itself to death" as it is expressed, so intense and unquenchable is the thirst in the disease.

In a few days this fever runs its course, resulting either in death or recovery; and from three to seven, or nine, are the extremes of its duration. During the progress of the disease there is almost total suspension of the secretory exercises, as manifested by dryness of the mouth and nostrils; diminution, or retention of the urine; constipation of the bowels; and, very early in the disease, complete sussuspension of the faculty of raising and chewing the cud occurs.

Such are some of the most striking phenomena attendant on the disease; and they represent, as already intimated, a ferbrile affection of malarial origin. But how can malaria be supposed to originate in pastures affording only the exhausted, half decomopsed herbage of dry hot seasons, totally different from the sources of malaria, believed to be the true causes of the malarial fevers of man? In reply I will state that it is not certainly known, for it has not as yet been demonstrated—that malaria exist, not even marsh miasmata—universally regarded as the causes of the remittant and intermittent fevers of man. But from the coincidence of these fevers, and certain peculiar reasons favorable to the decom-

position of paludal vegetable, or animal substances, in the near proximity of the abodes of individuals affected with these diseases; and no other sufficient causes likely to induce them being known to exist, and these fevers never making their appearance under any other circumstances of situation, season, and exposure, it has been universally conceded by medical men that miasmata, or malaria must cause them. How far the conditions of the unsound, half decomposed herbage of exhausted pastures, that have been repeatedly bruised by the hoofs, and contaminated by the breath, urine and excrement of cattle as they crowdedly graze them, will justify the belief, or rather the assumption contended for, in regard to the malarial origin and causation of cow distemper, can only be conjectured in the present state of our knowledge. It is extremely probable, however, from the facts already established, that future researches will fully confirm their correctness. There certainly is nothing unphilosophical in the belief, that herbage in a state of decay, during hot, dry weather in summer, can cause the disease; or even the miasmatic fevers incident to man, because their malarial decomposition is supposed to take place in non paludal and elevated situations remote from marshes. Long ago the celebrated Dr. Lind, who wrote learnedly as well as philosophically on the diseases of hot climates, remarked that a marsh could, to all intents and purposes, as far as the generation and evolution of miasmus was concerned, exist on the deck of a ship, provided the elements, and conditions, requisite for miasmatic decomposition, were present Heat, moisture, and vegetable substances, or a certain proportion of animal matter, perhaps, are the prerequisites for the generation of miasmus; and the writer believes it can be demonstrated to the satisfaction even of the most skeptical, that they exist in the locations, and during the seasons most favorable for the generation and evolution of the miasmus he believes to be the true cause of the distemper of cattle. As already intimated, the bruised, half decayed herbage of exhausted pastures, contaminated by the breath of numerous stock grazing upon it; or by the urine and excrement, supplies the solids; the dews, or fogs, the requisite moisture; and the sun the proper degree of heat.

Malaria thus generated may poison the economy, by entering it through the lungs with the air during respiration; or with the decomposing herbage, taken into the animal's paunch as food; or perhaps both may simultaneously be the avenues through which the morbific agent enters the system. After it reaches the blood, its tendency is decidedly to disorder the nerves that preside over organic life; and, consequently the ganglionary system is first and chiefly affected. Hence we may explain why the digestive system is so early and profoundly affected in the disease.

It will be useful and proper, as preliminary to the examination of the morbid changes of the organs chiefly diseased, to premise a short account of the organs themselves. And first, of the stomach, This organ consists of four cavities termed stomachs. The first usually denominated the paunch—the Ingluvies, rumen, &c., the second, termed honey-comb, or reticulum, from the reticulated appearance of the inner surface, caused by the irregular folding of its lining membrane, and is small and round; the third, termed usually, many-plies (the omasum) is likewise small, and its interior is distinguished by numerous deep folds resting on each other like the leaves of a book, studded over with countless hard tubercles; the fourth or reed—the abomasum is of larger size than the two last, is elongated, and terminates in the duodenum at its pyloric extremity. The Œsophagus, or gullet, which communicates between the mouth and stomachs, is a muscular canal capable of considerable dilating and contractile powers. It enters deeply into the paunch to the right, but in such a manner as to allow a groove, termed the Œsophagœal canal, which continues from it, to pass into, and through the second or honey-comb stomach, and to the third or many-plies also. This groove is bordered by two longitudinal muscles covered with mucous membrane, that commence in the paunch by thin folds, but becoming thicker and more prominent in the reticulum where they exist as two thick well-formed borders, bounding a canal or groove which, these muscular borders, or bonds can readily form into a tubular conduit by approximating their free margins. From this description it will be seen that the Œsophagus actually communicates with the first, second, and third stomach. The paunch

is much the largest of the four stomachs, and is situated on the left side chiefly, and projects downwards so as to form two cul de sacs. Its inner surface presents numerous well marked papillæ of conical form and firm nature. The second stomach is situated more in front, somewhat above and to the right of the paunch, and, as already stated, is small and round. Like the paunch, it is lined within by a dense and rough membrane moulded into prominent folds, which are so arranged as to form hexagonal cells like honey-comb, the free borders of which are studded over with wart-like prominences. The third is also of small size, as has been stated, is situated more superiorly, somewhat to the right of the liver, and its internal lining membrane forms numerous deep folds resting on each other like the leaves of a book, with their free borders presenting towards the cavity, and their whole surface invested with numerous, small, firm tubercles. The fourth, is of larger size than the two last, is elongated, terminates in the duodenum, is lined with a velvety mucous membrane distributed into several longitudinal folds, and is regarded as the true stomach.

The intestines are distributed into small and large. The small intestine commences at the pyloric extremity of the stomach, and extends to the ileocœcal valve, at which point the large intestine begins; and its first ten or twelve inches in length constitute what is termed the duodenum. The whole intestinal tube is 15 or 20 times the length of the animal, and is lined throughout with a mucous membrane that contains numerous minute glandules, more especially the small intestine near its commencement.

The liver is situated in the right side of the abdominal cavity, is large, and consists of three lobes, the largest being to the extreme right. This organ secretes the bile, which is deposited in the gall bladder, to be found on the under surface of the liver, near its middle anterior margin; and from this depository the bile is discharged into the duodenum about six inches from its commencement, through its duct, along with the pancreatic juice.

The kidneys are situated on each side of the loins, and discharge the urine, of which they are the true secretories into the bladder, at its inferior posterior part near the fundus, by a tube extending from each termed ureter.

Such, briefly, are the organs constituting the digestive apparatus; and they are genrally more or less implicated in the local affection of the disease under consideration, as they have been found to be the organs presenting on dissection the only perceptible lesions of structure.

The food, after being taken into the mouth, is conveyed into the paunch nearly unmasticated—through the Osophagus, or gullet, by the function of deglutition. As it reaches the termination of the gullet in the paunch, being bulky, it escapes into the cavity of that organ, by separating the muscular borders of the Osophageol groove. In this cavity it becomes moistened, by the secretions from its mucous lining, preparatory to the regurgitation of it back into the mouth for remastication, or "chewing the cud." Before the food is regurgitated, however, it passes into the second, or honeycomb stomach, where it is still farther moistened; and from which it is eructuated in small balls, or pellets, by the inverted action of this cavity, along the closed Osophageol groove, into the mouth. During this operation the inverted action of the second stomach is communicated to the Osophageol groove also, the shortening of which previously filled with the food as the second stomach contracts, forms the balls or pellets. These regurgitations take place after regular but short intervals; and as long as the animal is able to perform them, or to "chew its cud," as the operation is popularly denominated, it is regarded to be in a healthy condition.

After the food is thoroughly chewed, and perhaps insalivated, it is returned to the stomach through the gullet, but is now directed to the third or many-plies; which it readily enters, by reason of the pulpy condition, and reduced bulk of the nutritive mass, and the tubular condition of the Osophageol canal from the closure of its muscular borders. In this stomach important changes are impressed on the food by the secretions yielded from its lining membrane; but it is in the fourth stomach that it is completely digested, into which the pulpy mass next passes, where the gastric juice is brought to act on it, and where that fluid is only secreted.

Fluids never enter the paunch in a healthy state of that organ, but pass directly into the third stomach or many-plies. When the paunch is affected by disease,

the Osophageol canal is also implicated, and the power of forming it into a tubular conduit is lost, as also the faculty of raising and chewing the cud; and in this condition the animal weakens rapidly, and speedily dies, if it cannot be relieved. Into the small intestine the food passes from the fourth stomach, through the pyloric outlet, where important changes are wrought upon it by the secretious furnished from their mucous lining and fallicles, as well as by the bile, and pancreatic juice. It is here, however, that chyle is separated from the chymous or pulpy mass by the lacteals, commencing in the villi of their mucous lining, which convey that important fluid into the blood vessels for the purposes of nutrition, but not by a digestive agency; and if disease perverts this function, the condition of the animal will be equally menacing with that caused by suspension, or interruption of the power of raising and chewing the cud, if long continued.

The morbid appearances discovered after death are, more or less inflammation of all four of the stomachs, but chiefly the third, or many-plies; as well as of the kidneys, the intestines, liver, and, occasionally, the membranes of the brain and spinal marrow. In a large majority of fatal cases the folds of the many-plies are found inflamed, thickened and perfectly dry. The mucous membrane, lining the other three stomachs, as well as of the small intestine, is generally inflamed also, and more or less dry. The bladder is very generally found inflamed and filled with bloody, or highly colored urine. When the case ending in death has been protracted, the small intestine occasionally is ulcerated. There is much diversity, however, in these appearances as to their extent in the organs. When a case has rapidly proved fatal, they are less strongly marked; while in protracted examples they are uniformly more so, increasing in intensity with the duration of the disease.

The symptoms have already been briefly referred to, but it will be profitable to recapitulate them in connection with the morbid anatomy that has just been presented, as they will serve, in some degree, to elucidate each other.

The earliest symptoms, as far as the writer's experience enables him to state, are luggishness, or dullness, and disinclination for walking about. Very soon after, the animal refuses food, and about the same time it can be perceived that the power of raising and chewing the cud is lost. At this time, occasionally sooner, there is a disposition to separate from the herd and seek solitude, and water. The eyes now are reddened unduly, and often wild in expression. Near about this time, too, the animal is drawn up as if chilly, and upon examination actually feels cooler to the hand than natural, especially about the extremities, and seems to quiver with tremors of the thighs and head. There is also a disposition to stagger in attempts to walk. Very soon, now, the surface becomes unduly warm, and dry, and the hair seems parched and erected, as if it had been rubbed the wrong way with the hand, or a curry-comb. The thirst is now intense and unquenchable; the mouth and nostrils are dry; the suffering animal is restless, continually changing place, and posture, in wandering about, and lying down and getting up almost incessantly; there is retention of urine, or only small quantities of very high colored or bloody urine passed; and, in a large majority of cases, the bowels are constipated from the commencement of the disease throughout its entire course.

The treatment will be distributed into Preventive, and Curative, and its consideration will be brief: and first, of *the Preventive Treatment*. This may be effected either by confining cattle to pastures abounding in sound green herbage, also supplied plentifully with fresh running water, and wall shaded with trees; and by changing the pasture frequently during warm weather, taking care at the same time not to crowd too many cattle together in a pasture. Cattle should be shifted to a fresh pasture before the herbage is much bruised by trampling; and, likewise, before the pasture is closely grazed, or fouled much with urine and excrement. If the pasture is not supplied with running water, cattle ought to be driven to streams affording it, at least three times during the day. At night they should invariably have water before being put up.

The artificial food of cattle, if properly selected, exerts a beneficial influence in keeping them healthy during sickly seasons. It should invariably be sound and properly salted. The liquid food, termed wash, so generally used with milch cows,

should be well salted, but not to contain any of the coarse, dry, or even recent vegetables, because, it would greatly embarrass the operations of the Œsophagus, in transmitting those substances to their respective organs of reception. Very dry food may be moistened, but should never be mixed with large quantities of liquid of any kind.

An excellent preventive measure is the salting of cattle daily, by sprinkling the salt over narrow troughs previously varnished over their bottoms with tar. Sulphur and copperas may be used with the salt, especially if cows are infested with ticks or vermin. If this measure is early adopted, that is to commence with it as soon as warm weather sets in, and regularly and perseveringly kept up during summer, it rarely, if ever, fails to protect cattle against distemper. The salt itself is a preventive of the disease, by reason of its anticeptic properties. But the tar, sulphur, and copperas greatly enhance its protective powers. The tar tends to keep up the urinary secretions, as well as the secretions of the stomachs and intestines. The sulphur, too, acts on the secretories of the stomachs and intestines, as well as of the liver and skin. While the copperas gives tone to the organs of digestion, supplies the blood with its ferruginous constituent, and also acts in a degree as a disinfectant. Soot, clean new ashes, and salt may also be used with the tar, or without, and will be found valuable in preventing the disease. With cows giving milk the tar is objectionable, by reason of the terebinthinate odor it imparts to that fluid; and on that account it might be dispensed with in part, by only using it with the other stock, while the milch cows could use the salt, &c., without the tar.

The use of onions, in the food of cattle, serves, also, valuable protective purposes, by their tendency to act upon, and to maintain the secretions free, as well as by promoting digestion.

The free use of saltpetre will also prove highly serviceable, and it may be given with common salt, united with the other substances that have been mentioned; or it can be mixed in wash, or simple water. This article tends to keep the urinary secretion free and healthy, and to cool the general system. With the same designs flax seed and other vegetable substances tending to the urinary organs may be used.

Cleanliness is also necessary in guarding cattle against the disease; and with the design of promoting it, they should be changed frequently to clean fresh pens; or their stalls, if stabled, be daily cleaned out, and supplied with fresh litter.

Ticks have been supposed to predispose to the disease, and it is not by any means an improbable supposition; as they certainly tend to enfeeble the general health by the loss of blood they occasion; and at the same time to keep up unnatural irritation by their incessant and merciless biting and wounding of the skin. In every case they should be carefully removed, either by picking them off with the fingers and thumb; or with a currycomb; and the bites, as well as the general surface, rubbed over with camphorated lard, or train oil. This liniament should be used from time to time during the tick season; and a good currying now and then would be of much service, in giving it efficacy.

The Curative Treatment, that the writer has found most successful, is exceedingly simple, and is as follows. As soon as the animal manifests symptoms of the disease, the bowels should be opened by giving a commanding dose of Epsom Salts. Not less than a pound will be required as the dose; and it can be administered in a bottle of water, by way of a drench, most conveniently. As soon as the cathartic acts, or even before, if the symptoms are urgent, the following drench should be used. Mix three fresh eggs, that is the yolk and white; and one table spoonful of good gun powder a little heaping, in a quart bottle with flax seed tea, or slippery elm water, so as just to fill the bottle. The eggs must be well broken up, either by triturating them in a mortar with the gun powder, or by beating them in a bowl with a spoon, adding in the flax seed tea, or elm water gradually, so as to form an emulsion, This drench should be repeated once in three or four hours until the symptoms ameliorate. It will be proper to allow the moderate use of flax seed, or elm tea as drink. Generally the drink should be used cold in the early period of the disease; but after a few days continuance it will be best that it be given tepid. If these drinks are refused by the animal, it will be proper to administer them pretty freely as drenches. It will be necessary to give at

each time two or three bottles as a drench, as that quantity will be required to impart a proper degree of moisture to the dry surfaces of the third stomach for momentary comfort. Notwithstanding these fluids are used, cold water will be allowable, and should be used if the animal will drink it, in moderate quantities from time to time as drink.

The egg-drench is particularly suited to arid inflamed mucous lining of the many-plies; and if early commenced with, and perseveringly and effectually used, seldom fails to afford prompt relief. In numerous very unpromising cases, the writer has employed it with remarkable success. He has succeeded in curing with it six out of seven—the cases having been treated at different stages of the disease. This remedy is conveyed directly to the third stomach, through the Œsophagœal canal, like all other fluids swallowed by cows; and there produces its curative effects primarily and chiefly, by allaying the inflammation of that organ in the most gentle and soothing manner, as well as by promoting the secretory actions of its mucous lining. The albumen of the eggs, of which the drench largely consists, is one of our most valuable remedies in treating inflammation of the mucous membranes of the stomach and intestines; while the gun-powder promotes general secretion, but tending rather in a special manner, to act on the kidneys, by reason of the saltpetre it contains. The carbon may, in a degree, act as an anticeptic, and prevent, or retard, any putrefactive tendencies in the many-plies, or any other portion of the alimentary tube. The flax seed and slippery elm teas act also as soothing remedies, with the arid and inflamed mucous lining of the many-plies; tending also to restore the mucous secretion of the lining membrane of this organ, through the agency of the bland and soothing mucilage they contain, as well as to promote the secretion of urine.

In some cases attended with intense fever in the early stage, bleeding from the neck will be proper, and should be practiced. If the animal is young and well grown, the propriety of blood-letting could not be questioned, especially before purging is employed, and the fever intense. The writer has known the best effects to follow from it used under such circumstances; and the operation can be performed with a sharp pen-knife, or the common spring lancet, or a horse phleme. When employed, the quantity of blood drawn should impress the animal's strength decidedly, as manifested by staggering. Should the bleeding induce faintness the animal must be allowed to drink pretty freely of cold water; or a bucket of cold water may be dashed suddenly on the head and neck.

Other remedies have been employed, and advised in the treatment of this disease, some of which the writer has made trial of, but with the most unsatisfactory results.

Castor oil, for example, used as a cathartic, as also calomel employed with the same intention, but never with the slightest benefit. Various drenches have also been recommended and used, but they have, as far as the writer could judge, been useless, nay sometimes worse than useless, by harrassing the poor sick animals greatly. Perhaps the best drench that can be employed, except that formed of eggs, as already indicated, is the molasses and water freely used. This preparation is soothing as well as nourishing, and cows receive it with little resistance. If it does no good, no other injury is likely to follow from it but the loss of time, from using, and relying on it, instead of employing a more efficient remedy.

Throughout the treatment the bowels must be kept soluble, by use of suppositories of soap; soap and salt; soap and red pepper; or, by partially filling the rectum with very strong salt water, using for the purpose a large bladder, and a suitable gum elastic tube. Whether suppositories, or the salt water are used, it will invariably be best to apply the remedy as high up in the bowels as possible to ensure its purgative effects. The suppositories are to be introduced at the anus, and forced up into the rectum with the hand. In using the salt water, the tube should be carried up in the bowels fully a foot, by gently forcing its extremity along the passage in a probing manner before the fluid is forced out from the bag; and it must always be well oiled beforehand, as well as the suppositories. These measures should be used daily, unless the bowels are very open, as will sometimes be the case.

The food to be used with cows affected with this disease, should be carefully adapted to the condition of the diseased or-

gans as far as possible. In most cases there is an entire loss of desire for food.

It is necessary in every case to employ food, even if it is taken only in the smallest quantities, to keep up, if possible, the peristallic operations of the stomachs and bowels, as well as to reexcite the ruminating actions, also to prevent deterioration of the blood by replenishing it with fresh constituents. In the early periods, liquid farinaceous, or demulcent food should be preferred, such as oatmeal or corn meal gruel, rice water, or flax seed tea, or a gruel formed of the seed reduced to powder. Wheat bran, scalded, and formed into a mash, will also be useful, and proper at this period, and cattle will often eat of it when every other preparation is refused. It will be safest to allow only moderate quantities of even these light kinds of food, at a time, and after intervals of three or four hours. If a desire for light green food is manifested, especially such as fresh clover, lucern or cabbage leaves, or indeed any other mild fresh herbage, it might be allowed in moderate quantities. This kind of food is generally preferred by sick cows; and if they will eat anything at all, it will be fresh green food. These substances, too, after entering the paunch, which is their destined receptacle, tend to re-excite the ruminating actions, as well as to cool the irritated mucous membrane lining its cavity; and they should be presented to sick cows frequently to tempt them to eat

As the disease ameliorates, the wheat-bran mash, with corn meal added in from time to time in increasing quantities, with fresh green herbage will constitute the best food, but care will be required that the animal does not eat too much at a time. As a general rule, sick cattle should be kept in a cool well shaded pen, or stable, to prevent their eating improperly, or roaving about, and exercising too much. They should invariably be kept from water until entirely well, or they may over drink themselves; and by no means will it be safe to allow them to herd with well cattle until their strength is fully re-established.

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THE SOUTHERN PLANTER.

RICHMOND, OCTOBER, 1856.

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HOW TO SOW WHEAT ON PEA FALLOW.

As the use of peas in preparation for the wheat crop is annually increasing, it becomes a matter of some consequence to decide upon the best mode of preparing the fallow for wheat. Last fall we gave our reasons for preparing a shallow and rough seed bed for wheat, and it is unnecessary to repeat them. But in the case of peas many persons think it necessary to plough them under, and of course must do so with a deeper furrow than is required where a less bulk of vegetable matter is to be operated on. We do not agree with this opinion unless when other and exceptional circumstances call for deep ploughing. The object should be to plough peas up, not to plough them under; to tear up and not to subvert them. We have seen Mr. Edmund Ruffin, the king of pea culture, ploughing a heavy growth of peas with two horse ploughs running very shallow, where we are certain not more than one-half the vines were turned under, the wheat roughly harrowed in upon the surface, and yet his crops under that mode of management are remarkably heavy.

Still more recently we have heard from an enlightened farmer of King & Queen county that a very successful mode there practiced, is to sow the wheat down upon the peas, and with a two horse plough, get both vines and wheat in the land at one operation.

Still another plan which we propose to try this fall, is to smooth the vines down with a two horse harrow, sow the wheat and then plough with one horse ploughs. The general scantiness of the crop this fall in consequence of the dry season we have had every where, will enable it to be done without difficulty as to most of the land; whilst the heavier growth, which the ploughs will sometimes encounter, will test the practicability of this mode for an ordinary season.

The importance of some such speedy mode of sowing wheat is very great. The whole time of an ordinary fallowing with its attendant wear and tear of teams may be saved; whilst every one will be able to get his wheat seeded in good time, whereby a good start may be had for the crop, and the surest means of preventing the ravages of insects and disease be thus attained. Especially will it be true of this year when the lateness of the season will make every body reluctant to touch the pea fallow as long as it can be avoided. Another benefit of the plan of plowing the wheat is, that it will not winter kill as badly as if put in with the harrow. It will be in some sort a drilling,—at least a substitute for it, where the thing itself is impossible—and it is, or ought to be known, that in land subject to winter killing or heaving, the drill is almost a specific.

We beg our friends who have pea fallows and shall not have ploughed them up before this article reaches them to try these several modes, one or all, and report the result.

Wherever the wheat is put in with a harrow after the peas, it is important that it should be rolled with a heavy roller.

SECOND ANNUAL EXHIBITION OF THE SEABOARD AGRICULTURAL SOCIETY.

It will be seen from our advertizing columns that the second exhibition of the above society will take place in Norfolk from the 11th to the 14th of November, inclusive.

We had the pleasure of attending the first meeting of this Society in the fall of 1854, and can speak confidently of its merits, and of the kindness and hospitality of the people of Norfolk, which is not surpassed by any other city in Virginia.

The prevalence of yellow fever last year prevented the assembling of this Society; but we doubt not it will be as strong this fall as if its meeting had not been interrupted.

Taking place at a period subsequent to the meeting of the State Society, and when it will be perfectly safe to go to Norfolk, we hope they will have a very large company.

As there is no part of the State whose agriculture is improving faster, and none which exhibits larger farm profits, we advise the makers

of implements and machinery to take samples of their wares there.

The grounds are well arranged, and provided with suitable buildings, and the horse track is large and well located. In the exhibition of horses we cannot but anticipate a fine show. That country sent up to our fair last fall the two finest road horses that were exhibited, and we learn that they will be equalled if not beaten this fall by others from the same locality.

The premium list of the Society is in our office, where those interested are requested to call and examine it.

FAIR OF THE VA. STATE AGRICULTURAL SOCIETY.

This annual festival of the Farmers of the whole State is, as every body knows, to come off on the 28th, 29th, 30th, and 31st of this month, (October.)

We have been asked very frequently what sort of an affair it would be. Our answer has been the same to all: we cannot tell; nor have we ever been able to tell in reference to any previous exhibition. It depends altogether on the farmers themselves. The arrangements have all been made; everything will be in readiness at the appointed time; and we take it for granted that there will be an overflowing attendance as heretofore.

Ample time is allowed for all to reach the remotest part of the State in time for the Presidential election; and by coming down to compare notes beforehand, those who relish politics will have the field of excitement and enjoyment rather widened than otherwise.

It is useless to attempt to hold out inducements to attend, as every man in the State is as familiar with them as ourselves.

ARMY WORM.

The worm of which our friend speaks in the annexed article is the *army worm*. We have heard of its depredations in many parts of Virginia below the mountains this fall, and fear that serious injury has been done by it. In the neighbourhood of Richmond it has done great damage, especially to the market gardens. It is the same insect which sometimes ravages the cotton fields of the South, and does them immense injury.

We do not think there is any reason to apprehend its reappearance next year, as we have never heard that they appeared in successive annual broods like some of our other enemies of the insect tribe.

We have had the good fortune never to have seen them but once before. That was in the year 1844. In that case they attacked a wheat field adjoining a pasture in which were a good many hogs and turkies. After having stripped the blades from off the wheat stalks, they attempted to cross the pasture when the hogs and turkies made war upon them, and they were utterly exterminated. There were no other places in that neighbourhood attacked by them that we heard of.

If any of our friends, or any one else whose eye happens to light on the above can give any information of the history and habits of the Army worm, he will do a favour not only to us, but to a large portion of the agricultural public of Virginia.

To the Editor of the Planter.

DEAR SIR:

I am still pursuing the 4 Field System (corn, peas, wheat, and pasture,) with increased confidence in it, as the best adapted of all others, to the light land of Tidewater Virginia.

For wheat, I would rather have an acre of land seeded with a bushel of peas in the early part of July, and dressed with a bushel of plaster, as soon as the peas have four full grown leaves, than 200 lbs. of guano upon the same land.

In farming, one great secret of success, is to sell every thing which can be spared from the farm, and to buy as little as can be done, consistent with a judicious and profitable system of farming. In a majority of crops, the pea fallow will make as much wheat as the guanoed land, with comparatively, a very small outlay of money, and should the wheat be lost by a disaster, the increased fertility of the soil will fully remunerate for the money and labor spent upon the fallow.

The object of this communication is not to write about the 4 Field System and Pea Fallow; but to make some inquiries in regard to one of the many enemies the farmer has to contend with, and which has lately made its appearance in this section. A portion of my pea field being lime-burnt, I seeded upon it, the first of last April, 27 bushels of oats, which were again fallowed under in July, without any of the oats being cut, and peas were sown upon the worst

lime-burnt spots. The oats came up very thick, and looked as promising as the season would admit of. A week or two since, a neighbor and myself rode through the field without noticing anything amiss, and I flattered myself that with the fallow of July, and the green one I should have by the first of October, I should succeed in restoring the land and get a good crop of wheat from it. A few days ago, noticing a marked spot in the oats, I was induced to go and see what was the matter, when to my surprise I saw an almost innumerable quantity of worms, some of which resembled the cut worm of the Spring—others were more like the worm usually seen upon oak bushes in the Fall, and that they had nearly eaten up the entire field of oats, and are now eating every particle of fodder from the green stalks of an adjoining field of corn. They commenced upon the worst lime-burnt side of the field, where the oats had not matured when they were fallowed under in July, and where there were great numbers of chinch-bug.

Can these be what are known as the Army Worm, or Caterpiller so destructive in some sections of the country? Does your knowledge of these worms enable you to say, whether or not they will return to the field in the Spring? And should they return, is there any way by which their destruction can be arrested? By answering these inquiries, you will relieve, to some extent, the anxiety of my neighbors, and greatly oblige your obedient servant.

J. T. HENLEY,

WALKERTON, K. & Q. Co., Va., September 10th, 1856.

From the Laurensville (S. C.) Herald.

EXTRACT FROM A REPORT.

To the Laurens Agricultural Society, held at Laurens C. H. September 26th and 27th, 1855.

PLANTATION HYGIENE.

The attention which is beginning to be bestowed by physicians on the investigation of the Medical Topography of the prevailing diseases of the different sections of the country, is calculated to lead to the most satisfactory results. The investigation is an important one, as it is from the information it is likely to afford, that we are to arrive at a more correct knowledge of some of the most interesting points in relation to the etiology of many diseases, especially of those endemic to particular sections or neighborhoods.

In presenting a report or Plantation Hygiene it will hardly be expected of me to go fully into the details of the Medical Topography of the District, but it will scarcely be possible to adduce anything satisfactory without entering briefly into an investigation of the character above alluded to—the causation of some of our prevalent diseases. To know the cause of a disease is sometimes to be able to cure it, often to be able to prevent it. I propose, then, to offer you a few suggestions on the subject of causes, and to point out, as well as I can, in a paper of this length, the best means of removing them.

* * * * *

There are many and diversified causes of disease. But it will only be necessary for us to separate those which are of acknowledged local or temporary existence, and those to which the human body is often and necessarily exposed, and to treat principally of the former. The commonness of the diseases arising wholly or part from an impure or noxious principle of the air, called malaria, makes it necessary that I should present some points or questions connected with it, not with any vain expectation, however, of shedding upon the subject new light, or investing it with particular interest beyond what it has already received. This effluvia, so deleterious to health at certain seasons and in certain localities, is generally conceded to be generated in greatest abundance in marshy Districts, along water-courses, by ponds and stagnant pools; and that the immediate agents requisite for its production, are heat, moisture, and in many instances, vegetable matter.

It has long been considered, that the humid putrefaction of vegetable substances was necessary to the production of this peculiar and wide-spread poison, and it is no doubt true to a great extent with us. But not true universally. That the products of vegetable decay and decomposition do often co-exist with malaria, but are distinct and separable from it, and not at all times essential to its formation, there can be little doubt. There is reason to believe that the flooding of a porous earthy surface with water, and subsequent drying of that surface under a certain degree of heat, constitute the main conditions of the generation of the poison. This argues that it may depend, in part, or in some sections, upon some geological constitution of the soil itself, and also that it is not enhanced by the abundance of water, but the paucity of water where there has been an abundance. The wetest and dryest seasons, so far as malaria is concerned, seem most favorable to health. An abundance of rain, continued, would not favor the effect of malaria. Dry weather continued throughout the year, would also be unfavorable to the rapid decomposition of vegetable matter. Frequent rains, followed by hot days and cool nights, are almost sure to be accompanied by sickness.

The effects of malaria are modified by the temperature of the place; in low and hot situations it may give rise to an affection not dis-

similar to yellow fever, certainly not differing from the country fever prevalent in the lower part of the State; and in proportion as the location is higher and cooler, the fever may be remittent or intermittent. These fevers, with the congestive, are certainly the offspring of its presence, and its influence may be observed in many other diseases, during the times of its prevalence—mostly in the fall. But that it acts specifically in the production of some other forms of fever, which have been attributed to it I have reasons to doubt.

For the last several years, we have been, so far as I know, almost free from malarious diseases, and their subsidence had begun to give strong hopes, that its principle causes or sources were, to a great extent, removed or modified in our District. Our exemption, was, no doubt, owing in part to the cultivation of our bottoms and dry seasons, Vegetation was less luxuriant and the moisture wanting in the production of malaria.

The present year has been quite healthy throughout the District, until the last and present month, and the diseases which have made their appearance have been of malarious origin. We have been blest with a most flattering prospect in the growing crop. All kinds of vegetation have been luxuriant, and after maturing, it begins now to wither and decay, disease follows its decomposition. But the prevalence of malarieus diseases this fall has not been general, except in particular neighborhoods, and then traceable to particular places where other influences are at work in connection with the above. The experience of most physicians is, that for the first few years after bottom lands are brought under cultivation they are apt to generate more sickness.* The presence of malaria this year in some places has proven this opinion to be correct. A large tract of bottom, previously shaded and constantly moist, suddenly cleared up and exposed to the heat of the sun, will effect almost every one in its vicinity. This is owing to the more rapid decomposition of the vegetation, which had been previously accumulated within the soil, and which, being stirred up by the plow, is brought immediately in contact with heat and the surrounding atmosphere. It is well established, that the first steps of civilization in a wild malarious region, often rather increases the production of the poisonous agent, yet with the progress of cultivation, the country becomes more healthy even then it was originally, in consequence partly of draining, and partly perhaps of the productive growth to which the vegetable decay is made tributary. It requires time for cultivation to dissipate the cause, but the united measure of a whole community will accomplish it in the end.

* We are of opinion that if bottom lands were thoroughly drained one, two or three years before clearing them up and bringing them into cultivation, this would not be the case, at least to so great a degree.—Ed. F. & P.

But during the time of this temporary exemption from fevers of this sort, we have not enjoyed uninterrupted health. Typhoid fever, Dysentery and other minor complaints, have been in our midst. Every one in the community is more or less interested on the subject of Typhoid fever. It appears to be "the pestilence that walketh in darkness and the destruction that wasteth at noonday." But I cannot go into a full detail of its nature and causes. Such a thing is impossible in a report of this sort. I cannot, however, pass it without giving a few ideas as to its causes. The unhealthfulness of dead and decaying timber and of withering weeds are supposed to act an important part in its production. But the effluvia arising from these cannot be distinguished from that of marshes: and it is by no means certain that malaria will produce Typhoid fever. Malarious Districts have been observed to be comparatively free from its ravages. Besides, its form and character are so different, from other fevers which we are called on to manage, that it requires entirely different treatment. What difference there can be between the noxious gas of dead and decaying timber and weeds, and that from swamps, and its peculiar influence in the production of Typhoid fever, I cannot see. If it can be accused of discrimination, the highest and healthiest ridges in our District might be pointed to as the locations of its favorite resort. Whether ill-ventilated, crowded and uncleanly apartments will produce it or not, and we think they may, it is very certain that it spreads more rapidly and is more unmanageable in such places.

In my judgment, and it is concurred in by some of the leading physicians of the District, the same cause, or the same kind of cause which produced the bad form of Dysentery amongst us two years ago, has its agency in the production of Typhoid fever; and this was almost universally attributed to epidemic influence, favored, encouraged, and in some instances modified by the food and habits of the people. We have no power to extinguish the origin of epidemics, and the only principles of Hygiene which we can sensibly adopt in relation to them is to fortify the system itself against them. But as an epidemic may not at all times be wholly epidemic, but influenced by causes of a local and temporary character, it is important such local causes should be looked to. This is the case, to some extent, with this fever. Idio-malaria, or that generated about your premises—filth collecting in, under and about your negro houses, and about the persons of individuals, from improper clothing, diet and sleeping in badly ventilated apartments—may generate the fever, almost entirely, without or independent of the epidemic influence; certainly they will hasten its development and invite its spread where that influence is in the atmosphere. And if they were not capable of producing this disease, they will operate slowly, perhaps, but surely on the constitution of your negroes, and you will have

bowel affections, cutaneous diseases, and perhaps Scrofula.

We have seen that malaria is produced in low, damp places, generally strewed with vegetation and exposed to the heat of the sun. I should state further that its influence is mostly exerted on individuals at night, or just after sun set, or before sun rise. We have also intimated that cultivation, though increasing it for a short time, will finally destroy it. Trees intervening by attracting and absorbing it, will prevent its extension. Exposure during the particular hours of its prevalence should be avoided as much as possible. During sickly seasons it is far more economical to discontinue work early in the evening, and remain in late of a morning, if by so doing you can escape the poison; and when the evenings and mornings are cold, fires are beneficial. When the cause is supposed to reach or hover about your dwellings, the use of quinine, in small doses, or bitters prepared from Peruvian bark, have been recommended.

Every farmer ought to be capable of judging whether the buildings on his place are such as will be calculated to promote the health of their inmates. I have spoken of badly ventilated apartments in connection with idio-malaria, but too much cannot be said on this subject. Human beings, crowded together in tight houses vitiate the air themselves, by the detention of a large amount of carbonic acid gas within the room. The air we breathe is composed of oxygen, nitrogen, and a very small proportion of carbonic acid gas, and the product thrown out from the lungs is principally carbonic acid gas; and this gas, in a larger proportion than is found in the atmosphere, is exceedingly noxious—persons cannot live under its influence long. Too little attention is given to the construction of negro houses, in not providing properly for the admission of fresh air. The custom has been too prevalent to build their cabins on the ground with dirt floors, and so tightly chinked as to admit of very little air from without except what passes in at the chimney. The opposite extreme of having them too open is also injurious. During winter, either of these plans of building are liable to produce catarrhal affections among their inmates; the one by keeping them shut up or shut out from the surrounding atmosphere entirely during sleep—the consequence is, when they come out their constitutions are in a condition susceptible to cold—the other by exposure to a current of cold air during sleep. It is considered an error to suppose, because the negro covers his head and breathes the same air over and over again that he requires a smaller amount of oxygen than the white man. He is forced to get less when in a cold apartment, and the same contingency exists when he is shut up too close and crowded. Let your negro houses be elevated so as to admit of a free current of air under them, and keep them cleansed inside, outside and underneath. Suffer no filth to accumulate about them; let them be airy and roomy; have them whitewashed outside and in with lime, and let no apparent necessity allow you to permit them to become crowded.

The subject of hospitals for the sick on plantations has been so frequently presented to you through your Agricultural Journals, that it is unnecessary to enter into an argument on their utility in this report. The idea is a good one, and must meet the approbation of every sensible man.

We think that as a general thing, negroes are too lightly clothed during the winter months.—They withstand the effects of cold weather with less comfort than the whites. The latter may find it necessary to wrap himself in a cloak or blanket and sleep upon the cold earth, protected above only by the canopy of Heaven. The negro cannot safely or comfortably expose himself in such way, and if forced to do it of necessity, he must either have fire or he will soon begin to complain of the deleterous effects upon his constitution of the cold and chilling air. This inability to endure cold is in consequence of the slower generation of animal heat, "and he seeks to breathe the heated air for that purpose, whether to be found in the folds of his blanket or in the fire place." "It must be evident that the selection of proper clothing for negroes is one of the most important considerations connected with plantation hygiene; and such is now the cheapness of the coarse kinds of goods, which are most suitable for them, that no good reason can be given for neglecting to clothe them in a manner most conducive to the preservation of health—a measure required equally by considerations of humanity and interest, not to mention the danger of the loss of life from a want of proper protection by warm clothing, the loss of time, and expense of medical aid and medicine are much more detrimental to the profits of planting than even the most expensive arrangements in reference to this matter that can reasonably be suggested."

Much might be said on the diet and dietical regulations as a means of preserving health; but almost every one is so well prepared to inform himself on this subject that we deem it unnecessary to devote much of this report to it.—The inhabitants of this country have been accused of eating faster and consuming more indigestible food than any people on the globe.—We do not doubt but a great deal of the food consumed throughout the country is badly prepared and too hastily eaten, particularly by our business men. But there will be found as few dyspeptics in this country as any other; and as a general rule our negroes are fed on the most wholesome food, and they always have time to eat. It is believed by many that fat meat is injurious as an article of diet, even for negroes, and many of our summer complaints are attributed to it, while others think that on account of abundant fatty matter which pork affords, it is better calculated than any other for the healthful sustenance of the negro race: because this

fatty matter is supposed to be a source of animal heat, the generation of which is more tardy in the black than the white man. Fat alone is certainly more difficult of digestion than lean meat. Pereira, in his treatise on food and diet, holds the following opinion on the subject of fat bacon: "The fat of salt pork and of bacon is less injurious to some dyspeptics than fresh animal fats. This must depend on some change affected in curing it, for in the cases which have fallen under my observation, the fat of salt-pork or of bacon was the only fat which did not disturb the digestive organs. Dr. Combe, however, suggest that it may depend on the presence of bile in the stomach. But on this explanation, other fats should be equally digestible, which, according to my experience, they are not."—And the editor of this work adds in a note: "We have treated many cases of cholera infantum where every thing would be rejected from the stomach, except salt pork or fat bacon, rare broiled, and given in small quanties at a time. Many cases have recovered under such a diet where vegetable fairinaceous food could not be retained, or if retained, passed through the alimentary canal undigested." We do not advocate the free use of fat meat at any time, and when used during summer it should be combined with a plentiful supply of vegetables. On large plantations, the growing of garden vegetables sufficient to supply the wants of all the negroes is too much neglected. It is certainly fortunate that hog and hominy are produced in such abundance in the Southern Country—corn and pork constitute the basis of the food upon which our slave population is subsisted, and in a country where vegetables of almost every variety grow in such luxuriance, it is evident nature has equally adapted them to the healthful sustenance of the negro as well as the white man. Every family, on large plantations, should have its garden and time sufficient to cultivate it. This, like clothing properly, is demanded by considerations of interest to the owner, and enjoyment to the slave. We do believe, also, that an abundant supply of good fruit is of prime importance to the promotion of health, contrary as this opinion is to that of many.

One word as to the time of eating, particularly breakfast. It is a great error, especially during sickly seasons, to send your negroes into the field before eating. The system is more susceptible of the influence of cold, malaria and other morbid causes, in the morning before eating than at any other time; and hence it should be a point of duty always to give your hands breakfast before exposing them to the morning dews and other noxious influences.

It has been found that during the prevalence of bad forms of fever, of all the means used to check its progress, nothing proved so successful as an early breakfast. In aguish districts, also, experience has shown that the proportion of sick among those who are exposed to the open air before eating, is infinitely greater than among those who have been fortified by a good breakfast. In many constitutions much exertion or exercise, either of body or mind, before breakfast, operates injuriously, producing exhaustion, langour and unfitness for the ordinary occupations of the day. There are exceptions to this, but as a general thing we think it a matter of importance to breakfast soon after rising.

We might say something on the subject of abstinence from the use of wine and intoxicating drinks by those in health, as conducive to the preservation of that health, but enough has been and will be said on this point in support of the temperance reform. It was once simply recommended to the English people that they should, at some period of their lives, try the plan of abstinence from wine, and if it did not agree with them they had the remedy within their reach. Let abstinence be tried and it will not be found so full of thorns and briars as some suppose it is; it will more fully fit us to promote the best interest of man in his three-fold capacity of a physical, intellectual and moral being.

Respectfully submitted,

JOHN A. BARKSDALE.

From the Genesee Farmer.

THE PHILOSOPHY OF VEGETATION.

Perhaps there are few subjects of so much interest to the farmer as a proper understanding of the causes and agents of vegetable nutrition. The economical application of manures, the propriety of their use, the value of a system of relation in crops—in short the whole philosophy and practice of farming—may be said to be depening on this point. Is there but one substance in nature that constitutes the proper food of plants? or are they endowed with omnivorous powers, and capable of finding food in all things presented to them? If there is but one kind of food, what is that one?—and if there are many, what is their state when appropriated by the plants? These are a few of the subjects that enter into a consideration of the food of plants; and the opinions of writers on vegetable physiology have been as various and conflicting as the substances which chemical analysis has detected in plants have been numerous. Some have maintained that the actual nourishment was derived from the air: some that water alone constituted the food of plants; others have asserted that the growth was owing to a single substance, and that the earths which are present in plants, as well as most of the salts, are to be considered as merely accidental, not being necessary to

to the formation or growth of the vegetable: the only substance which all are agreed in considering absolutely indispensable, since it is a large and apparently essential part of every plant, is carbon. If the plant derives its support from the air, then the carbonic gas which exists in it must be the source of supply: if taken into circulation by the roots, then the carbon must exist in some soluble form, since the greatest chemical skill has never been able to induce a plant to take up the minutest portion of insoluble carbon, or detect its presence as an operation of nature.

Amidst these conflicting sentiments, adverse and contradictory as they may at first seem, we think that the opinions of men of science are verging to an agreement on one or two of the most essential points; and what we consider as of quite as much consequence, these opinions very nearly coincide with the actual experience of the farmer, and give a strong support to the modern theories and practice of agriculture.

We believe that Klaproth was the first to discover and announce to the world the existence of a peculiar substance, which he considered of importance to vegetable organization from its analysis, and which, from his first finding it in the bark of the elm, he denominated ulmin. Braconnet continued the investigation commenced by Klaproth, and found there were few substances of vegetable origin in which ulmin did not exist, tracing it in considerable quantities in sawdust, starch, sugar, seeds, and indeed in nearly all plants it was present. Berzelius, the great Swedish chemist, embraced it in his researches, and extending them to the soil, found that it existed in the earth in abundance, as well as the bark and ligneous substance of trees. From its presence in the earth, and the probability that it was from thence that plants derived it, Berzelius distinguished it by the name of *geine*, a word derived from the Greek word signifying the earth. Sprengel and Bouillay have discovered that it is a leading and efficient principle in vegetable and animal manures, and hence they have denominated it *humine*, a name by which it has been most generally known, though scientific men are appearing to incline to return to the nomenclature of Berzelius. The justly celebrated chemist and observer, Raspail, in his late work on Organic Chemistry, translated by Dr. Henderson, denies the existence of *geine*, or *humine* as a proximate principle in soils, and says, "it will be easy to see, that all these phenomena, (described by Berzelius, Sprengel and others,) apparently so varied, which have given room for the discovery of so many substances analagous to ulmin in their nature, are essentially nothing but a development of carbon." The name, however, we consider of mere secondary importance, and whether it is called *ulmin*, or *humine*, or *geine*, or *carbon*, it cannot effect the results which seem to flow from the substance and render it one of the most important agents in vegetable nutrition, if not the only one yet known.

Geine, says Professor Hitchcock, in his late admirable Report on the Economical Geology of Massachusetts, "when wet, is a gelatinous mass, which on drying, becomes of a deep brown, or almost black colour, without taste or smell, and almost insoluble in water; and, therefore, in this state, incapable of being absorbed by the roots of plants. Yet after the action of alkalis upon it, it assumes the character of an acid, and unites with ammonia, potassa, lime, alumina, &c. and forms a class of bodies called *geate*, most of which are soluble in water, and therefore capable of being taken up by the plants; and it is in the state of *geates* that this substance, for the most part, exists in soils."

Silica, alumina, lime, magnesia, oxide of iron, potash, soda, and sulphuric and phosphoric acids, may be considered the inorganic principles of vegetables, and analysis detects their presence in the most of them; hence they will be found the constituents of all soils, for the most part existing as salts—for instance, carbonate of lime, sulphate of lime, muriate of lime, phosphate of lime, &c. Neither the earths nor the salts can be considered the proper food of plants, as both these may be present, and yet a weak or imperfect vegetation, or none at all, be the result. But if the combination of these salts with humus or geine has taken place, then, in connexion with the earths, vegetation will be vigorous, and the proper functions of plants fully developed. In the language of Dr. Dana, it would seem then "that the earths are the plates, the salts the seasoning, the geine the food of plants."

The 'Soluble Vegetable Extract,' of

Davy and Chaptal, produced from carbonaceous mould, is the soluble *geine* of Berzelius, and the insoluble matter of the mould spoken of by Chaptal would seem to be the insoluble geine or humus of Berzelius and Sprengel. Geine is, therefore, the decomposed organic matter in the soil. When the result of recent decomposition, it is abundantly soluble in water; the action of the atmosphere converts this soluble matter into solid humus or geine, 'still partially soluble in water, and wholly soluble in alkali.' Soluble geine, and in this state only does it become the food of plants, acts neither as acid nor alkali. It is converted into a substance having acid properties by the action of alkali, and in this state combines with earths, alkalies and oxides, forming neutral salts, soluble in water, such as magnesia, lime, &c., and thus matter insoluble of itself is prepared for the food and nutrition of plants. It appears to have been satisfactorily established by late chemical researches, that this substance forms the nourishing basis of soils, and that they are fertile or infertile exactly in proportion to the soluble geine they contain, or the application of materials capable of converting the insoluble into that which is soluble.

If there are any facts certain in agriculture, it is, that a soil composed chiefly of one of the earths, either sand, lime, or clay; or one that contains an excess of salts, as pure manures ;' are always barren. Plants may indeed exist to a limited extent, but they will be weak and without fruit. To these earths add geine, and a perfect healthy vegetation will be the result. The great essentials of vegetation, then, are the earths, salts, and geine, and their degree of fertility will mainly depend on the proportion with which the last is mixed with the first.

Every discovery in experimental philosophy—every advance in vegetable chemistry, seems to render more clear the great truth, that nature's works, though apparently complex, are carried on in the simplest manner, and with the fewest possible agents. The slight shades of difference found to exist in the constituents of most dissimilar substances, such as starch, lignin, sugar, and some of the acids, prove that slight causes produce powerful modifications of matter, and render it probable that the original kinds of matter are less numerous than have been usually supposed. All investigations point to an agency that pervades all the forms of matter, and by an arrangement of atoms consequent on vitality produces all the varied forms of vegetable and animal nature. This agent, under the name of caloric, galvanism, or electro magnetism, is constantly at work modifying, changing, combining, decomposing and arranging. To it we owe aggregation and cohesion—to its subtile and diffusive energy, all growth and circulation—and may it not be considered as certain that the earths and salts are a magnificent voltaic battery, ever ready for action when moistened with water, and thus reviving the dormant vitality of the seeds submitted to its influence. But though this vitality may be revived, and the slumbering energy of this germ of the future vegetable be restored to activity, it is clear that the circulation will produce little or no effects in inducing growth, unless matter suitable for absorption and after-deposition, is provided for the newly awakened energies and action. This is furnished by geine, and is presented in a state the most suitable for the circulating juices of the plant. Taken up by the roots, or absorbed from the air, it is converted into lignin or woody substance by deposition and æration, and thus becomes a new plant, prepared to run its course of growth, maturity and decay.

Taking this simple, and we think philosophical view of the subject, the reasons of many farming processes, hitherto but little understood, are made more plain; and various improvements suggested and made practicable. If a soil on analysis contains an undue proportion of any one of the earths, the evil can be remedied by combining them in the proper manner, by adding what is deficient until the balance is restored. But the fact, that the earths themselves, uncombined with salts or geine, are never fertile, and that all the combinations of which they are capable, can never be made to support vegetation, should not be lost sight of. Some soils, from the proportion of the earths found in them, are more friable and easier to work than others; and some combinations are proved to be more suitable for the union with salts necessary to the excitement of voltaic or galvanic agency and the consequent vitality and circulation of plants; but alone, no possible modification or combination can make what is called a fertile soil.

Were we to name for comparison the agents and the several parts they perform in the process of vegetation, we could call the *earths* the plates of the galvanic battery, inert while dry, or not subjected to exciting causes; the salts by their solubility furnishing the acids, such as carbonic, sulphuric, phosphoric, necessary to rouse the battery to action; and when this is done, humus or geine offers the only matter that can be taken into circulation and constitute (properly speaking) the food of plants.

According to the modern investigations of science, every particle of matter is pervaded by this universal agent, and requires only the aid of moisture to its greater or less development; the intervention of the fluid serving as a conducting power between the several particles. Pure water is the weakest exciting power yet known, but at the same time the most durable. This is beautifully exemplified in the experiments of Mr. Crosse, who uses only water for the exciting power of his batteries when he requires their uninterrupted action for weeks or months, the slow continued excitement being most favorable to the development of animal life, or metalic or mineral crystallization, than one more powerful, but of shorter duration. This action of water shows why water alone, applied to the earths and through them to vegetables, has so feeble and tedious an operation on their development. On the contrary, if the acids are supplied, and this is done in a multitude of ways, the action becomes at once vigorous; and connected with a proper supply of food, vegetation will be rapid and abundant.

This theory of vegetable nutrition explains, in our opinion, far more satisfactorily than any other, the mode in which manures, vegetable, animal and mineral, produce their effect on vegetation, and stimulate its growth. According to Chaptal, the different substances afforded by animals, and useful as manure, including all their secretions, are, "gelatine, fibrine, mucus, fat, albumen, urea, uric and phosphoric acids, and some of the muriates or salts." Here, it will be seen at a glance, are a multitude of exciting and nutritive causes mingled, and when combined, as animal manures usually are, with vegetables decomposed, the available geine is considerably increased. The liquid manures found so powerful in Flanders, and the use of which is such a marked feature of the excellent Flemish husbandry, are, it is well known, mostly composed of the urine of animals. The analysis of urine of Mr. Brandt discloses the cause of this efficiency.

Water,	65
Phosphate of lime,	5
Muriate of Potash and ammonia,	15
Sulphate of Potash,	6
Carbonate of Potash and ammonia,	4
Urea,	5
	100

A more active combination could scarcely have been devised than this analysis shows such manures to be; and though Fourcroy and Berzelius slightly vary the constituents, their analysis does not materially alter or impair its efficiency. Of the animal ingredients, we will select but one to illustrate our theory, as it is one respecting the efficiency of which as a manure there can be no doubt, and which is daily coming into more general use—we allude to phosphate of lime or bone dust.

Bones, as a whole, contain about equal quantities of phosphate and gelatine. The harder and more compact the bone, the greater the amount of phosphate, and the less the proportion of gelatine. The bones of the ox contain from 50 to 55 per cent. of gelatine; those of the horse only from 36 to 40; those of the hog from 48 to 50; and the bones of the legs and feet of the deer, elk, roebuck, and hare, give an analysis from 80 to 90 per cent of phosphate. All the roots, such as beets, carrots, &c., and the grains, such as wheat, corn, &c. contain considerable quantities of this phosphate; and its presence would seem to be of much importance in the vegetable and animal economy. When bone dust is deposited in the ground, it speedily undergoes decomposition, and the principal ingredients in its composition are set at liberty to form new combinations, and perform a new part in the great circle of nature's revolutions. The phosphoric acid leaves the lime, and as in all its forms of existence it is one of the most exciting agents, its application to the earths is almost as immediate as the dip of the chemist's plates into the galvanic trough. The lime set free is, by the absence of the neutralizing acid, perfectly caustic, and seizing at once on whatever geine is found in the soil ren-

ders it soluble, and thus fit for immediate use by the plants while in their excited state of action. Can it be wondered at then, that bone dust should be efficacious, or that its effect on vegetation should be be almost instantaneous? It may be further remarked, that bone dust applied to very dry or very wet land, loses much of its efficiency; a reason for which may be found in the fact, that in the first instance the ordinary voltaic agent is but imperfectly supplied, and in the last, the acid is so diluted as to become but little superior to water itself.

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GENERAL NOTICE.

In accordance with the notice given in a previous number of this paper, we commenced with the July number to drop from our list, all subscribers who are in arrears for three years or more, and shall continue to do so until the first of January next, at which time we intend to drop all who are then in arrears for two years and upwards. But in doing so we do not intend to relinquish our right to collect our dues from such delinquents, but shall send out their accounts regularly or place them in the hands of Agents for collection. We do not design to adopt *strictly* the *cash system*, but we desire to approach as near to it as possible, and wish our "Terms," which are printed conspicuously in every paper to be understood by *all* our subscribers. They are as follows:

TERMS.

ONE DOLLAR and TWENTY-FIVE CENTS per annum, or ONE DOLLAR *only*, if paid in *advance*. Six copies for FIVE DOLLARS; Thirteen copies for TEN DOLLARS—to be paid invariably in *advance;* and to them we mean strictly to adhere, with this variation only, subscribers who owe for two years, or $2 50 and remit, $5 will be credited for two years of arrearages and three years in advance. We think no one who intends to pay can object to this arrangement.

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