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THE

SOUTHERN PLANTER,

A MONTHLY PERIODICAL

DEVOTED TO

Agriculture, Horticulture,

AND THE

HOUSEHOLD ARTS.

AUGUST & WILLIAMS, PROPRIETORS.
J. E. WILLIAMS, EDITOR.

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THE SOUTHERN PLANTER.

Devoted to Agriculture, Horticulture, and the Household Arts.

Agriculture is the nursing mother of the Arts. [XENOPHON.	Tillage and Pasturage are the two breasts of the State.—SULLY.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

VOL. XIX. RICHMOND, VA., JANUARY, 1859. No. 1.

English Agriculture.

We return our thanks to Sam'l Sands, Esq., of Baltimore, for the following interesting account of various agricultural experiments, published in the Baltimore American.

We take this occasion to call the attention of all farmers to the agency established in Baltimore, by Mr. Sands, for the purchase and sale of lands—live stock, &c. For full information in regard to the objects of this agency, see the card of Mr. S. in our advertising columns.

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LETTER FROM DR. GERARD RALSTON.

London, September 15, 1858.

Messrs. Dobbin & Fulton:—A few days ago I made an excursion, with some American gentlemen, to the most interesting country-seat of the liberal and public spirited English country gentleman, John Bennett Lawes, Esq., near Harpenden, twenty miles from London, and a few miles beyond the ancient and most interesting city of St. Albans, (celebrated for its magnificent Abbey, nearly the largest and most beautiful of the churches of England) and entering the park of Rothamstead, we soon discovered that we were visiting an old-fashioned but most beautiful and well maintained country-seat of a wealthy landed proprietor. Driving through the park, which abounds with large Elms, Oak, Ash, Lime, Beech, Birch, Acacia, Plane and other beautiful trees, and seeing numerous sheep and cattle which, in my opinion, ornamented the park far more than useless deer, which I am sorry to say, too often encumber the parks of the gentry of England, we arrived at the venerable Hall, an ancient mansion of about three hundred and fifty years old, which, on examining we found to contain every thing that wealth and luxury could make conducive to the comfort of its residents. We found the walls of its drawing-room, &c., decorated with the landscapes and other pictures of its tasteful mistress, and its hall was ornamented with the spoils of the chase of its excellent master; but, leaving the house and walking over the soft Turkey carpet-like lawn, admiring the flower-beds, shrubbery and beautiful grounds, we entered an avenue of old Lime trees, under whose delightfully odorous boughs, we took a refreshing lunch, and then proceeding under the guidance of our scientific and courteous hosts, Dr. Gilbert, (Doctor of Philosophy and Fellow of the Chemical Society) and Dr. Evan Pugh, of Westchester, Pennsylvania, we examined the experimental farm which is so celebrated, not only in these Islands, but throughout the Continent also, for developing agricultural improvement. At this place Mr. Lawes owns about 1,800 acres of land, in addition to some estates in Scotland, of which 1,630 acres are employed as arable land, and for farming purposes, and 100 acres are purely what is called the park, and devoted to grass and the pleasure grounds only. The remainder, or 70 acres, are used for scientific agricultural experiments for ascertaining what are the laws of vegetable growth and nutrition, in order to fully understand how to raise a maximum crop at a minimum expense.

What we first examined was under a glass roof and protected from the wind at the sides by a screen, a number of plants, including the most commonly cultivated cereal and leguminous and root crops, growing in tin vessels, with 40 lbs. of soil each, and the plant issuing at top through a small hole in a glass plate, which is soldered on to the top so as to prevent any evaporation from the soil, except that which goes off through the leaves of the plant. The pot is weighed when the seed is planted, as so also is all the water added during its growth, at the termination of which the crop is dried and weighed, and the amount of dried matter in it compared with the amount of water evaporated from the leaves. It is found that for every part of dry matter freed, 250 parts of water pass through the leaves, or for every ton of wheat or grass produced upon a field, 250 tons of water must have been evaporated from the vegetable matter producing it. Or for a field of grass producing 3 tons per acre, 750 tons (about 500 barrels) of water must have passed off from every acre. This points to the cause of the good effect of rain, and the damage of drought—shewing the dependance of the former upon the seasons.

We next examined the effect of different manures upon grass; 17 lots, of one-half an acre each, have been under experimentation for the last 4 years. The result shows the natural produce of the ground (which has not been ploughed or showed for the last two hundred years, and which has only natural grasses upon it) is for this years, per acre, 1 ton, 2 hundred weight, 20 pounds. This is not increased by 2,000 lbs. of sawdust just beside it on another plat. But 14 tons of barn-yard manure per acre produced 2 tons 7 cwt., 2 qrs. Rye grass, soft broom grass, Bent grass were particularly developed, while worthless grasses, as Quaking grass, Dogstail grass and several weeds, (Plaintain, &c.) were either entirely lost or much diminished in quantity. An addition of 2,000 lbs. of sawdust produced no effect on the manure plat. An addition of 400 lbs. of salts of ammonia (the sulphate and muriate of ammonia) per acre gives 1 ton, 15 cwt., 2 qrs. and 6 pounds. And mineral salts (sulphates of potash 300 lbs., of soda 200 lbs., of magnesia 100 lbs., and 200 lbs. of boneash, with 150 lbs. of sulphuric acid) give 1 ton, 16 cwt. 1 qr. 22 lbs. Sawdust has no effect on either of the latter, but the latter, on addition of 400 pounds of ammonia salts gives 3 tons, 4 hundred weight 0 qrs. 4 pounds. The addition of 800 lbs. of ammonia salts gives 3 tons, 7 cwt. 0 qrs. 4 lbs. Other results are equally striking, but the most remarkable fact is the change produced in the quality of the grass by these manurial substances. The sawdust has no effect whatever, either upon the quantity or the quality of the grass. All the substances which give much increase, tend to keep down the weeds. The mineral salts, the sulphates, with phosphates, tend largely to develop the leguminous plants; clover, lotus, lucerne, &c., were here developed in a marked degree. The large increase of ammonia, whether with or without minerals, showed the development of large quantities of heavier and coarser grasses, as Dactylus glomerata, and Bromus mollis. These experiments, when carried out with great care and exactness for a series of years, will supply a rich store of information as to the value of different manurial substances for the promotion of different kinds of grasses. Not only are the statistics with regard to crops and manures kept, but small plats, are selected in each plat, and in these each kind of grass is planted and the amount weighed, so that the exact relation between the several quantities produced may be recorded.

EXPERIMENTAL WHEAT FIELD.

There are 40 plats, each containing three-tenths of an acre, on which wheat has been grown continuously under different circumstances for the last 15 years. It would be impossible here to enter into the details of these experiments. Several elaborate papers have already appeared in the journal of the Royal Agricultural Society of England, in which the statistics here obtained are given, and from which, conclusions have been drawn that have elicited much discussion, both in England and Germany. It is found that on this soil, which is a rather heavy clay interspersed with the chalk flints, the continuous yield without manure is about 18 bushels per acre. The addition of ammonia salts without minerals for 15 years has at last so far exhausted the mineral constituents in the soil, that the produce by such salts now is not as great as formerly, yet it now gives 30 bushels per acre. The addition of mineral salts, (sulphate of potash 300 pounds, of soda 200 lbs., of magnesia 100 lbs. and bone ash 200 lbs., with sulphuric acid 150 lbs.) scarcely raises the unmanured plat above its normal amount (20 to 24 bushels per acre being thus obtained.) But other plats showing the effect of the different quantities of ammonia with these minerals are most marked. The addition of 200 lbs. of ammoniacal salts per acre with these mineral salts, gives for 1857 (this year 1858 results being not yet ready) thirty-five bushels per acre; four hundred pounds of ammoniacal salts with minerals 46 bushels per acre; 600 lbs. of ammoniacal salts with minerals 50 bushels per acre, but this large quantity is liable to fall down, owing to the great development of straw. The great point claimed for these experiments is, that they show that the atmospheric sources of nitrogen (or ammonia) are not "amply sufficient for the purpose of agriculture" as has been contended by some. They also point out the great value of the highly nitrogenised manures, or the Peruvian guanos, &c.

EXPERIMENTAL BARLEY FIELD.

There are also twenty-four plats of one-sixth of an acre each. These have been going on for seven years upon the same land. They also show results corresponding to those just noticed. Unmanured plats about half a crop, (29 bushels ;) with 14 tons of barnyard manure a good crop, 51 bushels per acre; mineral manures; (sulphate of soda, potash and magnesia,) about half a crop (32 bushels ;) super-phosphate of lime, a little more, (33 bushels ;) (super-phosphate of lime and sulphurate of soda, potash and magnesia,) yet more, (39 bushels ;) nitrate of soda (Chili saltpetre,) gives 47 bushels; ammonia salts, about a like quantity, and a mixture of all the minerals (alkalies and phosphates,) and ammonia salt, gives 57 bushels per acre. Which latter number, points to what purely artificial manures are capable of doing. The crop is about double: "two straws are made to grow where but one grew before." It also points to the fact that the crop is not produced by any *one substance*, that no *quack nostrum* or stimulant can be put upon land by which it will be made to produce without all these various constituents applied to get this 57 bushels of barley per acre. If any one of these substances produces an effect it is because the other substances already exists in the soil, ready to act in concert with it. The experiments show that nitrogen and phosphoric acid are most generally deficient in soils; and hence the addition of these substances produced great results; not that *they* alone do it, but because they were the only substances failing in the soil, and without them nothing can be produced. They are but two links in the middle of a chain, without which the chain has no strength, but *they are not the whole chain* as a superficial observer might be led to suppose.

5th. Other experiments were made with beans and turnips, but they are ommitted for the present.

7th. We next go to the Laboratory. Here is a fine building erected by the farmers of England, at an expense of upwards of 7,000 dollars, and presented to Mr. Lawes as a testimonial of his liberality and of his great services in Agricultural Chemistry. It is most admirably fitted up with sands-baths, water-baths, muffle furnaces, &c., &c., drying-rooms, &c., &c., for all the various operations of drying, analysing, &c., &c., of the products of the experimental fields. The different grains and root crops are dried, the amount of ash determined, and put away for analysis. The elaborate system of shelves and cupboards are full of specimens of ash of grain and straw ready for further investigation. An extensive collection of preparations of the different parts of animals including the fat, the flesh, the bones, the tendrons, &c., &c., of all the different organs of the animal body. These had been used in an extensive investigation involving the slaughter and careful cutting up and weighing of some hundred head of cattle, hogs and sheep, by which, when taken into connection with the statistics of food eaten by them, the relative value of the different kinds of food to produce fat, flesh, &c., &c., would be ascertained.

8th. Dr. Evan Pugh's own experiments.

Explanation.—"No non-nitrogenized substance can form an element of nutrition."—*Baron Liebig.*

Animals can't live without nitrogenous foods. Animals must live on vegetables; hence vegetables must be nitrogenous.—They must get their nitrogen from the air, or soil, or from both. They must get the form of *pure nitrogen gas*, of which air contains 78 per cent., or they must get it from compounds of nitrogen, of which the most common are nitric acid and ammonia. From which of all these sources (air or earth, the pure nitrogen gas, the ammonia, or the nitric acid) do plants get their nitrogen? The importance of this question is heightened by the high price of nitrogenous manures. If plants can get nitrogen from the exhaustable resources of the free nitrogen gas of the air, why not seek to find the circumstances under which it is obtained, and avoid paying for saltpetre, guano and other nitrogenous manures? It must be decided whether plants are capable of assimilating the free nitrogen at all. To do this our countryman, Dr. Pugh, came to Rothamstead.

The plants experimented upon must be grown in a soil and an atmosphere, free from nitrogenous compounds, must be evolved with water containing no such compound, and then the plant so grown analysed, to see if it contained any more nitrogen than the seed contained. To free the soil from nitrogen it was heated red hot for several hours in an iron muffle, and then washed with pure water for several days, and finally ignited simultaneously with peat, and the ash of the plant to be grown in it. The red hot soil and red hot ash were then brought into the red hot pot, and well mixed and allowed to cool under a large glass vessel set in sulphuric acid so that no ammonia of the air could get to the soil. Once cooled down, pure water was added, and the seeds of known weight and per centage of nitrogen were planted, and the whole removed to large glass shades, 3 feet high and 10 inches diameter. These shades rested in grooves filled with mercury at the bottom, so that all communication with the external air was cut off. By aid of bent glass tubes going down into the groove through the quick silver under the glass shade and rising in the inside of the vessel, water and air free from ammonia were supplied to the plant. By a complicated system of bottles partly filled with sulphuric acid and tubes with pumice wet with this acid, the air supplied was purified from ammonia, and by passing a stream of water from a cistern into a close vessel, from which the air only could pass out though a tube leading into these bottles, a constant steam of ammonia, free air is passed to the plant. In this way 18 different vessels are arranged, in which wheat, barley, oats, beans, peas, clover, tobacco are grown, some with no ammonia, others with measured quantities, to see if a gain takes place by assimilation of nitrogen from the air. The plants to which no nitrogen was given, and which contained no more than that contained in the seed, were only a few inches high; those to which combined nitrogen (sulphurate of ammonia) had been given, were five to ten times as high; thus showing that the plant could not grow without the aid of combined nitrogen—in other words that the nitrogen of air cannot be assimilated. But before this point can be settled with accuracy, the whole crop, the whole soil and the pot must be analysed to see if the entire nitrogen thus found agrees with that in the seed, *plus* what was added. This will take much work yet.

Other points are the gas found in plants. By a simple piece of apparatus the work of getting the gas out of a plant is reduced to that of a few minutes. Quicksilver is made to run out of a vacuum and this is brought in communication with a vessel filled with water, (that has been boiled to free it from air) in which the plant is placed. The air rushes out into the vacuum with great rapidity, and in ten minutes can be collected.—This I saw done. The gas was then analysed and shown to consist of carbonic acid, nitrogen and oxygen in very different proportions from what is given in the books upon this subject. This method will be very useful for all cases of getting gasses from plants, from fluids, or from animal secretions and excretions. Dr. Pugh has already made some hundred analyses of the gas plants, and hopes to follow up the investigations when he returns to America. On our way to the Laboratory we saw an extensive field, which the the liberal proprietor of Rothamstead has set aside for allotments of three-fourths of an acre to one and a quarter acres each for each family of his work people who cultivate their vegetables during the intervals of labor, and in this way are prevented from going to the beer-houses—the bane of working classes of England. Mr. Lawes has, most munificiently, also built a very tasteful and convenient club-house, which is well warmed and lighted and abounds in books, papers, &c., and where a very sensible and pious clergyman preaches on Sunday evenings, so as not to interfere with the Church of England services during the day. This establishment also offers a powerful rivalry to the beer-house and gives additional motives for the greatful feelings of the people of Harpenden towards their benevolent and public spirited Lord of the Manor, Mr. Lawes.

The plain farmer of America may inquire of what good are all these elaborate experiments? What is the use of this science, and this extended investigation into the products of the earth? A great many discoveries of an important practical kind have been made; a series of experiments, both on the growth of the most important crops, and the feeding of animals for the production of meat and manure, has been gone through. As to the first of these questions, the course adopted was to grow by different chemical manures some of the most important crops year after year on the same land—for example, the cereals, the leguminous crops and the root crops, and at the same time, to grow experimentally the same crops one after the other, in the order in which they would follow each other in rotation. In like manner vast series of experiments had been made on the connection between the amount of food consumed by fattening of animals, and the increase and manure which they yielded for that food, and many of the results have been published in the journals of the Royal Agricultural Society, and in pamphlets and publications which have been followed by great benefit to the community. The practical result is, that this and other old farms in this country, that have been under constant cultivation for upwards of 1,000 years, produce from 48 to 58 bushels of wheat per acre, whilst the farms of New York and Pennsylvania, which have been under culture for only 50 or 60 or 75 or 100 years, are constantly diminishing in produce, and our fellow-townsman, Henry Carey, in his most interesting letters to President Buchanan, published this year, (1858) says that 12 and 15 bushels of wheat are now produced, where formerly 25, 28, and 30 bushels were grown. So of barley, of Indian corn, of tobacco, of cotton and other articles, whether they be products of the North or South, or the East or West. This retrograde movement in our agriculture *must be checked*, and I am happy to say that our fellow-statesman, the scientific, energetic, persevering and most zealous and successful analytic and chemical agriculturist, Dr. Pugh, of Chester County, Pennsylvania, is the very person to teach our farmers how to recover the ground they have lost, and to make our fields in Montgomery, Berks, Lancaster, Chester, Delaware, &c., &c., in Pennsylvania and all over the United States, produce as good crops as are common in Norfolk, Berks, Hertfordshire, &c., in England, which have been in constant cultivation since the time of the Romans.

I am glad to say Dr. Pugh is soon to return home. He has been attending the Universities and Agricultural Colleges of the Continent for some time, and also has made most diligent inquiry into the best farming practices of the Continent. He has been at Harpenden for two years, and in connection with the learned, scientific and experienced Dr. Gilbert, who is the chief of the Laboratory, and of the scientific staff for carrying out the magnificent experiments of the liberal and enlightened Mr. Lawes, who has been spending for the last fifteen years an average of £1,500 per annum purely in scientific and economical investigations. Dr. Pugh has profited much by the opportunities he has had at Harpenden, and I hope when he returns home he will be induced to establish an Agricultural College, to teach all the sciences and all the practice that are required by our rural population to enable them, not only to prevent a further decline in agriculture, but by the application of suitable manures and the proper treatment of the land, to restore the fertility of the soil, so that we may again have, not only 25 to 30 bushels of wheat per acre, but have this product advanced to 50 or 55 bushels, which is by no means uncommon in many of the counties of this old and long cultivated country, and if it had been treated as badly as Virginia has been, would now be a worn out and exhausted and miserable country, with its 4 or 5 bushels of wheat only to the acre.

Dr. Pugh has been remarkably fortunate in making the acquaintance of such gentlemen as Mr. Lawes and Dr. Gilbert, who in the development of agricultural improvement, have been of inestimable value to this country, and I may add, to Europe. Mr. Lawes being a man of great public spirit and of most enlightened mind, and being blessed with a very large fortune, (say $50,000 per annum,) has, with a zeal and patriotism beyond praise, devoted at least $7,500 per annum, for the last fifteen years, to the improvement of agriculture, and Dr. Gilbert, with all the science that could be procured from the best education, from Baron Liebig, and other eminent chemical agriculturists, and from other sources, which his investigating spirit has found out, and is every way qualified to assist our enterprising countryman in his investigations, and he has accordingly taken advantage of the ample resources furnished by the liberal minded Mr. Lawes and the devoted (to scientific investigation) Dr. Gilbert, to make experiments, which he has not yet given to the world, but which, I hope, when made known to our countrymen, will incite to an improvement of agriculture, which will be of inestimable benefit to our country. Dr. Pugh returns soon to Pennsylvania. I hope his success will be as complete as his great merit entitles him to.

I am, very respectfully, yours,
GERARD RALSTON.

From the Valley Farmer.

The Way to Wealth.

Benjamin Franklin, the self-taught American philosopher, was perhaps the most extraordinary man that this country has ever produced. It may be impossible to gather from the history and labours of one individual mind more practical wisdom and varied instruction than he has given to the world. For many years he published the Pennsylvania Almanac, called Poor Richard (Saunders) and furnished it with many wise sayings and proverbs which related to topics of "industry, attention to one's own business, and frugality." The most of these he finally collected and digested in the following general preface, which sayings are so peculiarly adapted to the present times, that we do not know that we can do our readers better service than to give them a place in the *Valley Farmer*. These sayings were not more applicable to the people and the times one hundred years ago than to the present, and their teachings should never be lost sight of, until the world is much wiser and better than it is at present:

The Way to Wealth, as clearly Shown in the Preface of an old Pennsylvania Almanac, entitled "Poor Richard Improved."

"COURTEOUS READER:—I have heard that nothing gives an author so great pleasure as to find his works quoted respectfully by others, then, how much I must have been gratified by an incident I am going to relate to you. I stopped my horse lately where a great number of people were collected at an auction of merchant's goods. The hour of the sale not being come, they were conversing on the badness of the times; and one of the company called to a plain, clean old man with white locks, "Pray, Father Abraham, what think you of the times? Will not these heavy taxes quite ruin the country? How shall we be able to pay them? What would you advise us to?" Father Abraham stood up and replied: "If you would have my advice, I will give it you in short, for 'a word to the wise is enough,' as Poor Richard says." They joined in desiring him to speak his mind, and, gathering around him, he proceeded as follows:

"Friends," said he, "the taxes are indeed very heavy, and if those laid on by the government were the only ones we had to pay, we might more easily discharge them, but we have many others, and much more grievous ones to some of us. We are taxed twice as much by our idleness, three times as much by our pride, and four times as much by our folly; and from these taxes the commissioners cannot ease or deliver us, by allowing an abatement. However, let us hearken to good advice, and something may be done for us; 'God helps them that help themselves,' as Poor Richard says.

"I. It would be thought a hard government that should tax its people one-tenth part of their time to be employed in its service, but idleness taxes many of us much more; sloth, by bringing on disease, absolutely shortens life. 'Sloth, like rust, consumes faster than labour wears, while the used key is always bright,' as Poor Richard says. 'But dost thou love life, then do not squander time, for that is the stuff life is made of,' as Poor Richard says. How much more than is necessary do we spend in sleep, forgetting that 'The sleeping fox catches no poultry,' and 'That there will be sleeping enough in the grave,' as Poor Richard says.

"If time be of all things the most precious, wasting time must be,' as Poor Richard says, 'the greatest prodigality,' since, as he elsewhere tells us, 'Lost time is never found again; and what we call time enough, always proves little enough.' Let us, then, up and be doing, and doing to the purpose; so by diligence we shall do more with less perplexity. Sloth makes all things difficult, but industry all easy, and he that riseth late must trot all day, and shall scarce overtake his business at night, while Laziness travels so slowly, that Poverty soon overtakes him. 'Drive thy business, let not that drive thee, and early to bed and early to rise, makes a man healthy, wealthy and wise,' as Poor Richard says.

"So what signifies wishing and hoping for better times? We make these times better if we bestir ourselves. 'Industry need not wish, and he that lives upon hopes will die fasting. There are no gains without pains; then help, hands, for I have no lands, or, if I have, they are smartly taxed. He that hath a trade hath an estate, and he that hath a calling hath an office of profit and honour,' as Poor Richard says; but then the trade must be worked at, and the calling followed, or neither the estate nor the office will enable us to pay our taxes. If we are industrious we shall never starve; for, 'At the working-man's house hunger looks in but dares not enter.' Nor will the bailiff or the constable enter; for 'Industry pays debts, while despair increaseth them.' What though you have found no treasure, nor has any rich relation left you a legacy? 'Diligence is the mother of luck, and God gives all things to industry. 'Then plow deep while sluggards sleep, and you shall have corn to sell and to keep.' Work while it is called to-day, for you know not how much you may be hindered to-morrow. 'One day to-day is worth two to-morrows,' as Poor Richard says, and further, 'Never leave that till to-morrow which you can do to-day.' If you were a servant, would you not be ashamed that a good master should catch you idle? Are you, then, your own master? Be ashamed to catch yourself idle when there is so much to be done for yourself, your family and your country. Handle your tools without mittens; remember that 'The cat in gloves catches no mice,' as Poor Richard says. It is true there is much to be done, and perhaps you are weak-handed, but stick to it steadily, and you will see great effects, for 'Constant dropping wears away stones,' and 'By diligence and patience the mouse ate through the cable,' and 'Little strokes fell great oaks.'

"Methinks I hear some of you say, 'Must a man afford himself no leisure? I will tell thee, my friend, what Poor Richard says, 'Employ thy time well, if thou meanest to gain leisure, and since thou art not sure of a minute, throw not away an hour.' Leisure is time for doing something useful; this leisure the diligent man will obtain, but the lazy man never, for a life of leisure and a life of laziness is two things. Many, without labour, would live by their wits only, but they break for want of stock, whereas industry gives comfort, and plenty, and respect. Fly pleasurer, and they will follow you. 'The diligent spinner has a large swift; and now I have a sheep and a cow, everybody bids me good-morrow.'

"II. But without industry we must likewise be steady, settled and careful, and oversee our own affairs with our own eyes, and not trust too much to others; for, as Poor Richard says,

> 'I never saw an oft removed tree,
> Nor yet an oft removed family,
> That thrive as well as those that settled be.'

"And again, 'Three removes are as bad as a fire;' and again, 'Keep thy shop, and thy shop will keep thee;' and again, 'If you would have your business done, go, if not, send.' And again,

> 'He that by the plow would thrive,
> Himself must either hold or drive.'

"And again, 'The eye of the master will do more work than both his hands;' and again, 'Want of care does us more damage than want of knowledge;' and again, 'Not to oversee workmen is to them your purse open.' Trusting too much to others' care is the ruin of many. For in the affairs of this world men are saved, not by faith, but by want of it, but a man's own care is profitable; for 'If you would have a faithful servant, and one that you like, serve yourself.' A little neglect may breed great mischief; 'for want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost, being overtaken and slain by the enemy.' All for want of a little care about a horse shoe nail.

"III. So much for industry, my friends, and attention to one's own business; but to these we must add frugality, if we would make our industry more certainly successful. A man may, if he knows not how to save as he gets, keep his nose all his life to the grindstone, and die not worth a groat at last. 'A fat kitchen makes a lean will;' and

'Many estates are spent in getting,
Since women for tea forsook spinning and knitting,
And men for punch forsook hewing and splitting.'

"If you would be wealthy, think of saving as well as of getting. The Indies have not made Spain rich, because her outgoes are greater than her incomes.

"Away, then, with your expensive follies, and you will not then have as much cause to complain of hard times, heavy taxes, and chargeable families. And farther, 'What maintains one vice would bring up two children.' You may think, perhaps, that a little tea or a little punch, now and then, can be no great matter, but remember, 'many a little makes a mickle.' Beware of little expenses; 'A small leak will sink a great ship,' as Poor Richard says; and again, 'Who dainties love, shall beggars prove,' and moreover, 'Fools make feasts and wise men eat them.'

"Here you are, all together at this sale of goods and knicknacks. You call them *goods*; but, if fineries you do not take care they will prove *evils* to some of you. You expect they will be sold cheap, and perhaps they may for less than the cost, but, if you have no occasion for them, they must be dear to you. Remember what Poor Richard says, 'Buy what thou hast no need of, and ere long thou shalt sell thy necessaries.' And again, 'At a great penny worth, pause a while.' He means that perhaps the cheapness is apparent only, and not real; or the bargain, by straightening thee in thy business, may do thee more harm than good. For in another place he says, 'Many have been ruined by buying good penny's worths. Again, 'It is foolish to lay out money in a purchase of repentance,' and yet this folly is practised every day at auction, for want of minding the almanac. Many a one, for the sake of finery on the back, have gone with a hungry belly and half starved their families. 'Silks and satins, scarlets and velvets, put the kitchen fires out,' as Poor Richard says.

"These are not the necessaries of life; they can scarcely be called the conveniences, and yet only because they look pretty, how many want to have them? By these and other extravagances, the genteel are reduced to poverty, and forced to borrow from those whom they formerly despised, but who, through industry and frugality, have maintained their standing, in which case it appears plainly that 'A ploughman on his legs is higher than a gentleman on his knees,' as Poor Richard says. Perhaps they have had a small estate left them, which they knew not the getting of; they think 'It is day and it will never be night,' that a little to be spent out of so much is not worth minding; but 'Always taking out of the meal tub and never putting in, soon comes to the bottom,' as Poor Richard says; and then, 'When the well is dry, they know the worth of water.' But this they might have known before if they had taken his advice. 'If you would know the value of money, go and try to borrow some, for he that goes a borrowing goes a sorrowing,' as Poor Richard says; and indeed so does he that lends to such people, when he goes to get it again. Poor Dick further advises and says,

'Fond pride of dress is sure a very curse,
Ere fancy you consult, consult your purse.'

And again, 'Pride is as loud a beggar as want, and a great deal more saucy.' When you have bought one fine thing, you must buy ten more, that your appearances may be all of a price; but Poor Dick says, 'It is easier to suppress the first desire than to satisfy all that follow it. And it is as truly folly for the poor to ape the rich, as for the frog to swell in order to equal the ox.'

'Vessels large may venture more,
But little boats should keep near shore.'

"It is, however, a folly soon punished, for as Poor Richard says, 'Pride that dines on vanity, sups on contempt. Pride breakfasted with plenty, dined with poverty and supped with infamy.' And after all, of what use is this pride of appearance, for which so much is risked, so much is suffered? It cannot promote health, nor ease pain; it makes no increase of merit in the person; it creates envy; it hastens misfortunes.

"But what madness must it be to *run in debt* for these superfluities? We are offered by the terms of this sale, six months' credit, and that, perhaps, has induced some of us to attend it, because we cannot spare the ready money, and hope now to be fine without it. But ah! think what you do when you run in debt; you give to another power over your liberty. If you cannot pay at the time, you will be ashamed to see your creditor, and will be in fear when you speak to him; you will make poor, pitiful, sneaking excuses, and, by degrees, come to lose your veracity, and sink into base, downright lying; for 'The second vice is lying, the first is running in debt,' as Poor Richard says, and again, to the same purpose, 'Lying rides on debt's back,' whereas a free born ought not to be ashamed, or afraid to see or speak to any man living. But poverty often deprives a man of all spirit and virtue. 'It is hard for an empty bag to stand upright.' What would you think of that prince or that government who should issue an edict forbidding you to dress like a gentleman or gentlewoman, on pain of imprisonment or servitude? Would you not say that you were free, have a right to dress as you please, and that such an edict would be a breach of privileges, and such a government tyrannical? And yet you are about to put yourself under such tyranny when you run in debt for such dress! Your creditor has authority at his pleasure to deprive you of your liberty, by confining you in jail till you shall be able to pay him. When you have got your bargain, you may, perhaps, think little of payment, but as Poor Richard says, 'Creditors have better memories than debtors; creditors are a superstitious set, great observers of set days and times.' The day comes round before you are aware, and the demand is made before you are prepared to satisfy it; or, if you bear your debt in mind, the time, which at first seemed so long, will, as it lessens, appear extremely short. Time will seem to have added wings to his heels as well as his shoulders. 'Those have a short Lent who owe money to be paid at Easter.' At present you may think yourselves in thriving circumstances, and that you can bear a little extravagance without injury, but

'For age and want save while you may—
No morning sun lasts a whole day.'

"Gain may be temporary and uncertain, but even while you live, expense is constant and certain. 'It is easier to build two chimneys than to keep one in fuel,' as Poor Richard says, so, 'Rather go to bed supperless than rise in debt.'

"IV. This doctrine, my friends, is reason and wisdom, but, after all, do not depend too much upon your industry, and frugality, and prudence, though excellent things, for they will all be blasted without the blessing of heaven, and therefore, ask that blessing humbly, and be not uncharitable to those that at present seem to want it, but comfort and help them. Remember, Job suffered, and was afterwards prosperous.

"And now to conclude,—'Experience keeps a dear school but fools will learn in no other,' as Poor Richard says, and scarce in that, for it is true, 'We may give advice, but we cannot give conduct.' However, remember this, 'They that will not be counselled cannot be helped;' and further, that 'If you will not hear Reason, she will rap your knuckles,' as Poor Richard says.

"Thus the old man ended his harangue. The people heard it and approved the doctrine, and immediately practised the contrary, just as if it had been a common sermon; for the auction opened, and they began to buy extravagantly. I found the good man had thoroughly studied my almanacs, and digested all I had dropped on these topics during the course of twenty-five years. The frequent mention he made of me must have tired any one else, but my vanity was wonderfully delighted with it, though I was conscious that not a tenth part of the wisdom was my own which he ascribed to me, but rather the gleanings that I had made of the sense of all ages and nations. However, I resolved to be the better for the echo of it, and, though I had at first determined to buy stuff for a new coat, I went away resolved to wear my old one a little longer. Reader, if thou wilt do the same, thy profit will be as good as mine.

"I am, as ever thine to serve thee,

"Richard Sanders."

For the Planter.

State Fair.

The State Fair at Petersburg was generally considered a successful and creditable affair. The intercourse of persons, strangers to each other personally, meeting together and discussing questions relating to agriculture, in which all are interested and engaged, has a happy tendency, and a good effect. We become acquainted with each other, with the diverse modes of doing business in different parts of our State, and thus often obtain new ideas in our own business, or may make new suggestions to others. One of the most valuable features of these annual gatherings, is the discussion carried on by the society at night, in which all are invited to give their experience in any thing relating to agriculture, whether it be an improved mode of operation in farming, new implements, or any thing bearing upon general cultivation. There is one great advantage, it appears to me, that might arise from these discussions that now does not obtain, and that is a good reporter to take them down, and then publish them with the society's transactions. In this way their benefit would be generally circulated, and be of advantage to others besides those present at these meetings. Many who desire it cannot attend them.

The "American Pomological Society" that lately met in New York City, have been in the practice of having their discussions on fruit, &c., reported, and published in their transactions. In this way a large amount of valuable information is disseminated yearly, and is of far more practical value than if merely confined to the members of the society then present. A like benefit would result to the public by having the discussions of the State Agricultural Society published also, and I would most respectfully suggest, that in future the Executive Committee be directed to employ a competent reporter to take them down, and that they be published in the transactions of the Society, even if the premiums should have to be lessened to provide for the expense.

I attended one of these discussions one evening in Petersburg, and was much interested with the subject of under-draining land, and the cultivation of corn, as spoken to by members then present. These discussions satisfied me that a more general acquaintance with the principles of geology would be desirable. We have in our State, and often in a small part of it, all the members of the geological columns, and in many parts of the State they are largely developed. The tertiary deposits for instance, cover most of the State from the head of tide-water to the ocean, and here its beds of "sand and gravel, of clay, marl and shells, are every where to be seen, and a knowledge of their position and extent would be of invaluable advantage in underdraining such lands. Though not personally acquainted with much of that region of country, there is reason to believe that the higher grounds between the rivers and large streams, in general, has a sandy and gravelly soil, and that this stratum often, if not generally, extends beneath the vallies, and that there a bed of clayey or loamy soil rests atop of it. This upper stratum often contains a sufficiency of clay to make it difficult for surface-water to penetrate beneath it, and the surface being nearly level, causes the water to be retained to the injury of growing crops. This bed of sand and gravel often comes to the surface on higher ground, and the water there entering it, it becomes saturated beneath the bed of clay, causing the water there to press upward, and where it can issue, will cause a spring at the surface, but more generally will ooze very gradually through the clay bed and make the surface a cold and wet soil, unfavorable to grain crops. This appears to have been the condition of the lands of the President on Pamunky River, which he had drained very effectually by tapping this bed of gravel at the lowest possible point by a deep ditch, thus drawing off the water from the gravel bed, and preventing its pressure upward through the more compact bed above it, and thus draining land at least half a mile off.

Another member gave his experience in underdraining, where the stratum was similar with but this difference, the under bed of sand and gravel, instead of being saturated with water, was comparatively dry. Here this bed evidently had an outlet on lower ground, perhaps in the bed of a river, and thus was drained off its water. Here an opposite course of operation answered the end effectually. As it was only necessary to guard against surface water, this was done by boring holes with a post-auger through the clay bed into the gravel bed, thus discharging the surface water in that way. This being done in the lowest places, and when the field was put down to wheat, and the holes left open, would protect that crop. Stones not being convenient, else the holes might have been filled with them; but as they were renewed with little labor, they could be easily opened again at the sowing of the next crop, when stock would not be admitted in the field. These holes would partially fill up during winter, but answered the end effectually for the time.

Here were two distinct operations for draining land, both answering the purpose under their respective conditions, and it is not unlikely both might be adopted to advantage in some localities. For instance, where the gravel bed could be drained as the President's was, there might be places where the surface water could be more readily discharged by boring post-holes into the gravel bed than by any other mode.

Other modes of underdraining were practised by other persons. These different plans show the necessity of studying the character of the formations beneath the surface, so as to adopt the best method of effecting the end desired. In other parts of the State these plans could not be carried out. In the Piedmont region of our State, bordering the Blue Ridge, we have no beds of sand and gravel, or of clay, lying horizontally beneath the surface. Our soil is derived entirely from the decomposition of the primitive rocks now in place, and they being tilted up at a high angle, presents the different strata of rocks, either wholly or partially decomposed in that situation. And these strata being full of cracks, seams, and fissures, readily admit the water into the bowels of our hills, from whence it finds its way out to the surface of the foot of the hills in small streams, giving us an abundance of good water for stock purposes. No other country with which I am acquainted is as well watered as this. Many farms may be divided into ten acre fields, and have running water in every field, and yet but little land that needs underdraining—the country is too rolling for surface water to lie long on the ground. Some few spots are benefitted by being thrown into beds, as is practised largely on tide-water.

Some discussion on the cultivation of corn was incidentally entered into, and some questions asked whether deep cultivation of growing corn was best, and whether hilling it up was advisable. Experience is the best test in this matter, and I propose to state the mode adopted by one of my sons, who now farms my land. His plan is, to plough deeply—in the spring if possible—as soon as the ground is in good order after the frost is out of it. There is always a longer, or shorter season, at that time, when the ground is in good order for ploughing mellow. This is preferred to fall ploughing. Then, at the proper season, harrow the ground to a fine tilth, but be sure *to do that*, by using the clod-crusher if not effected without it. He has made an implement to mark his ground—in this way. He takes the fore-wheels, axle, and tongue, of Pitt's Thresher and Cleaner, and to these he has attached a piece of timber, say four inches square and longer than the width of two rows of corn, with three arms about two or three feet long mortised into it, and fastened to the axle at each end, and the middle with a hinge-joint, so as to raise up and down. Into this piece of timber are three other pieces mortised, say two feet long, to stand at an angle like a shovel plough stock; to these pieces, small shovels are attached and placed just as far apart as we want the rows of corn to be. Then with one hand and two horses, three rows may be marked out at a time, thus doing work rapidly; go over the field both ways before planting, then drop the corn cross-ways of the last marking out—it will be much more correctly dropped than to go the other way.

For covering the corn he uses horse power, with a plough somewhat similar to a shovel plough, only with two shovels fastened to the stock of the plough by a bar of iron bent in form of a half circle with a small shovel at each end about one foot apart, and the middle of the plough attached to the plough stock. Thus by running one shovel on each side of dropped corn, it is covered with a small ridge over it; this ridge will not bake so hard with heavy rains as if covered flat, and the corn comes up better; and then if we have heavy, washing rains, the shovel marks on each side of the row leads the water along side the corn, and not over it, and prevents its washing as badly as if the whole of the water ran over the hill of corn. This advantage was very perceptible in this section last spring with our heavy rains, the corn was not washed, I suppose, half as badly as if the old mode of planting had been adopted. This places the corn but little below the level of the ground, and if the ground is in proper order, it is hardly necessary to again harrow it, but after the corn gets up a little, run a double-shovel pretty close to the corn, so as to throw a little earth around the hill, then after the grass and weeds begin to grow again, go through it the other way, covering up the grass around the hills, in the meanwhile thin it at suitable times, and use such fertilizers as may be advisable. We have seldom used any thing but plaster and ashes, and never put a hoe into the corn field after planting, if then. We very often go through our corn but twice to cultivate, sometimes, though rarely, three times, and with fair seasons we expect from 40 to 60 bushels per acre. We then decidedly prefer level culture, using only double-shovels, and they not large ones—and deprecate hilling of corn in cultivation, or stirring the ground deeply after planting. The ground can be much easier put in order before planting than after, and then the after work is much easier. YARDLEY TAYLOR.

Loudon Coun'y.

For the Planter.

The Guano Controversy.

MR. EDITOR—I am "old fogy" enough still to think that true faith and sound principles are necessary in order to good morals and correct practice. In the August number of the Planter, over the signature of "Wm. A. Bradford," I was pleased to find a well written piece, which ably supports my views as set forth in a critique upon "X. of the Republican," and in my replication to his rejoinder, to wit: that guano is not a mere stimulant, furnishing no pabulum for the plant, nor fertility to the soil. This is ably sustained by Mr. Bradford; but *he* denies what *I* admitted, that guano and other manuring agents, *may* "*stimulate*" the plant. Says that gentleman: "I do apprehend how in the animal kingdom agencies of this kind (meaning stimulants) are more or less operative, but I have yet to learn the mode in which the vegetable kingdom is rendered thus impressible." Now, sir, it is plainly one thing to know the fact of a certain existence, and quite another to "apprehend" the mode and manner of its existence and operation. We *know* that food, taken into a healthy stomach, nourishes the body, but how the process of digestion, assimulation and final appropriation to fat, muscle, bone, sinew, &c., is carried on, has not been, and may never be "apprehended" by finite minds. The thing to be apprehended, is not "the mode in which the vegetable kingdom is rendered thus impressible," but the fact. If the fact is found to exist—there must be some "mode," whether "apprehended" or not. Again says this gentleman, "vegetables are not subject to the action of mere stimulants. In its common acceptation, a stimulant is any agent that exalts or quickens the vital forces or actions." Animals that have to seek their food, are endowed with sensation and are urged by the calls of nature, to use the powers of locomotion with which they are constituted, to meet the demands of appetite, but the poor plant feels no want of food, and if it did, it is incapable of making any exertion to obtain it."—Some animals have "no power of locomotion," and will scarcely be "urged by the calls of nature" to use powers of locomotion with which they are "not" constituted.—What then? Of course having no use for it, they have no "sensation," and cannot be "subject to the action of mere stimulants." Thus it may be seen the gentleman places some animals and vegetables in the same category. Where then shall the stand point be found, above which the susceptibility to stimulants ranges, and below which it ceases. Animals have "powers of locomotion" to seek food, and are therefore "endowed with sensation." "Vegetables" have no "powers of locomotion," and therefore *they* have no sensation. But some *animals* have no "powers of locomotion," and therefore they too have no sensation. Is not this a logical sequence? Again, "vegetables," says the same writer, "are destitute of the semblance of nervous excitability." If this be true, how is it that the sun-flower inclines to the sun in his diurnal course? Will the answer be, because it has been thus constituted?—This explains no more than to say, *it is so because it is so.* Why may we not say that the "vegetable" being "endowed" with "excitability, or the susceptibility of being acted upon by the rays of the sun, thus inclines? How is it that the leaves of the sensative plant droop upon a touch of the hand? that some flowers close their petals upon a similar touch, and some again are open by day and close at night? These are facts, and demonstrate that "vegetables are rendered thus impressible." The gentleman admits plants to be "provided with organs of circulation, absorption and secretion," and that these organs are controlled by physical laws and though destitute of the rudest form of nerves, yet that there exists a mysterious force, a *vis vitæ*—a "divinity within that shapes its end." All this I contend but demonstrates that "they are thus impressible" and are susceptible of "the action of stimulants," agents that exalt and quickens the vital forces or actions." Vitality is indeed dormant, without the action of such agents, and can exhibit none of the active properties or phenomena of life. The leafless tree and torpid toad present like spectacles, in the animal and vegetable kingdoms. The genial warmth of the vernal sun awakens (stimulates) each to life again. "But how it exists, or where the force resides," is, very truly, "beyond human ken," as all the operations of nature are. "For who by searching can find out God?"

One remark more: The gentleman seems to ascribe the difference in the permanence of guano as a manure, and the ordinary home-made manures, entirely to the larger quantity of such manures as commonly applied. This may, to some *small* extent, be true—but I think it ascribable to a much greater extent, to the fact, that all home-made manures contain a large proportion of coarse material, that cannot be elaborated and assimilated, to a condition to act as food for the plant sooner than the second or even the third year after its application, whereas guano is already in a state to meet the demands of the plant, needing only due mixture with soil and solution.

Notwithstanding this liberty of criticism has been taken, I render to the gentleman a tribute of thanks, that he has rendered me such timely and efficient aid in my conflict with the Herculean lance of "X. of the Republican." Should his shot overtake "X." prancing on his gallant hobby, "stimulate the soil," it can scarcely fail to inflict a fatal wound. B.

For the Southern Planter.

Action of Lime and Marl on Tide-Water Soils.

The October number of the Southern Planter contains an article from "Wm. D. Gresham, Esq., of Forest Hill, King & Queen county," entitled the "Action of Lime, or Marl, on Soils Below the Falls of the Tide-Water Rivers of Virginia." All he says of both lime and marl is true, and but for them our Tide-Water country would have been abandoned by its owners, as it begun to be in 1832, and as it continued to be for several years thereafter. But the emigrants to the "Sunny South," encountering unlooked for privations and sacrifices, had cause to long for the "flesh pots" of Old Virginia, and to observe that the few who remained at home, and bought themselves rich by buying their lands at from three and a half to four dollars the acre, were doing a better business than they who were "going out" to make cotton. About this time, or a little after, the "Farmer's Register" was commenced in "little Petersburg," by Edmund Ruffin, Esq., and much did it do to keep men here at home, and to stop the Southern and South-Western tide then "setting in." About that time a distant light first began to gleam upon the vision of our most intelligent farmers.

From pride, birth, and the ownership of estates that none save the Indians and their own cavalier ancestors ever owned, the present owners did not wish to sell. This determined them to find some means to enable them to hold these lands—when lo! the lands themselves contained the means within them. A little research, a little exertion, deep drainage, and the application of lime or marl, transformed these "old fields" into prairies; the forlorn homestead into a tasty mansion, that a Davis or a Percivall might have fashioned. Lands purchased from spendthrift owners in 1843, at $17, in 1858 are worth more than $60 per acre. Such is the "action of lime or marl on soils below the falls of the Tide-Water Rivers of Virginia," yet, all is not known nor understood. These miocene marls *most always* betoken the proximity of eocene marl. The converse, however, is *not* true. Miocene is the top, eocene the bottom. We have the bottom along our rivers, without the top, but never the top without the bottom, because it is too weighty. Understand me. The eocene is not necessarily immediately under the miocene, but it is not far off. I have seen them in close proximity. But whoever, in the Pamunkey country, has miocene marl, will find the eocene if he will but look for it. In the cliffs and ravines where he finds his miocene, if he will go low enough, he will be certain of reaching eocene. This I have seen both from farming experience and from cuttings on the York River Railroad. I expect it is equally true of the Mattapony country. For on one occasion I remember to have seen eocene marl in the river bank just above Mantua, and on another occasion in Gloucester, at Warner Hall, I saw what I took for eocene marl, but the owner said it was miocene marl and marsh mud combined, (what is called in this county "blue fuller.") It is a rich marl, but to which class it belongs I am not geologist enough to say, though I am farmer enough to have used it, and to have found it a *rapid* improver. I applied it on forty acres of land, which had made previous to its application but two barrels and a half of corn per acre, and this year, dry as it has been. it made five barrels of corn per acre. We do not altogether know what we possess in this lower country. beyond the certainty of ague and fever, which deep drainage and a free use of lime or marl will remedy, and in some cases prevent.

Tide-Water farmers, who would not check their career of improvement, must beware of *tobacco*, lest while they are making that, to obtain cash in hand, their capital is depreciating. For the $100 per acre to be made on twenty acres of tobacco, they are losing $40 per acre on the hundred acres of land they might marl whilst making the twenty acres of tobacco. Land worth twenty dollars per acre down here, having three hundred bushels of eocene marl per acre applied to it, is immediately worth forty dollars per acre. The more heavily you marl within a reasonable limit, and the more deeply you drain, the more heavily you can crop. We present the singular phenomenon of owning land which we can crop "*ad infinitum*," and improve "*ad infinitum*," at the same time, and under the same process. Tobacco, however, is a crop demanding so much attention and care, that whilst that care and attention are being bestowed on it, the rest of the farm is being neglected. If gentlemen would first get their lands heavily marled, and deeply drained, they may then entertain tobacco speculations with propriety, for then "with the will there comes the way," and not until then. With proper care and attention we can raise any product of the temperate zone. This, all may not believe, but it is nevertheless true. We want our farmers to be educated, and we want capital to come amongst us. I have never yet known a well educated man, with a tolerable command of capital, who once located amongst us, who wanted to quit. In ease and cheapness of access to market, and the number of markets open and available to us, no country can excel ours. All of these are matters of the first moment, and the larger our Atlantic cities grow, and the more numerous they become, the greater must be their influence on the price of all lands tributary to them by means of steam and sail navigation. Who was the first Tide-Water man, who commenced the use of marl, I cannot say, I have *heard* that old Mr. John Roane, of King William, was the first. He marled a lot and was so pleased at the result, that he never failed to take his visitors to see it, but *never* marled *any more*. (I won't sware to the truth of this.) Next was Mr. Thomas Carter, of Pampatike. He marled his front field, but so heavily that it is only within the last few years that the land has recovered from the excessive application. Both of these were miocene marls. After that, the use of eocene marl was commenced on a farm in King William county, not far from Newcastle Ferry, (but not the Newcastle farm,) and the friends of this gentleman feared that a love of good society, and of eocene marl, *would break him*. This was as far back as 1833. What induced the three gentlemen above named to use these marles I cannot say, but have a vague impression that they had been used in New Jersey under the direction of Professor Henry D. Rodgers, who, from geological information, and from the use of marls in England, advised their use in New Jersey, and wherever *else* they were known to exist. I cannot tell the exact year the "Farmer's Register" was begun, but think the gentlemen above mentioned had commenced their experiments *prior* to its publication. That Journal took the matter up, and did all it could to encourage the use of both lime and marl. If any one who may read this has information as to who was *certainly* the *first* man to use marl, and *what induced* its use, we will be much pleased to learn. The reader must not understand me as saying, that the mere fact of owning a farm with marl under it, is synonymous with having a rich one. The poorest farm I now can think of, is one with the greatest amount of natural advantages. It is enterprise and exertion, combined with a vigorous attention, that changes the Pamunky and its adjacent sand-fields, into

"Sweet fields arrayed in living green, and
rivers of delight."

On these same sands and marshes, where once the partridge and the snipe were the best owners, now are seen "a most living landscape, and the wave of woods and corn-fields, and the abodes of men scattered at intervals, and wreathing smoke arising from such rustic roofs." The whistle of the farm steam engine, and the creak of the marl cart, all tell the age and section in which we live. I, for one, believe that Eastern Virginia has seen her lowest ebb, and that the "springs of the rising tide" will bear us on to greatness. With the "Enquirer" of *old*, let us say "*nous verrons*."

TIDE-WATER FARMER.

From the Michigan Farmer.

The Feeding of Milk Cattle.

If a Farmer have a pair of cattle, and he neither wants them to work nor to make beef, he feeds them enough to keep them in condition, but whenever he wants them for a long pull of steady work, he begins to give them food in quantities that will not only support them, but will also supply all that they waste by muscular exertion. If he does not feed in that way the cattle will not only lose flesh, but at last will become so weak that they cannot perform a full day's work, so that the farmer suffers pecuniarily in two ways by this attempt at being saving—for the cattle decrease in value, and their work is also less in amount than it should be. Every farmer will exclaim, "The man who does business in that way, is unwise, and imprudent, as well as ignorant of his true interests;" yet it is very probable, that the same process of depreciation is going on in their own barn-yards amongst their milch cows.

What is milk? Is it not a certain amount of raw material, produced by the animal either from a surplus of food, or by a waste of the actual substance of the body. If the animal has a surplus of food *and is able to consume it*, its body suffers no diminution, nor does the supply of milk; but when it has only a sufficiency of food to support the waste constantly going on from vital action, the supply of milk is only yielded at the expense of the carcase, and the farmer loses at both ends, the cows depreciating in value, and the yield of milk being less and less, until it is utterly dried off, and there is nothing left but a skin and a skeleton.

It is no unusual incident to have a farmer point out to us one of these specimens of skin and skeleton as the best cow he has in his yard for milk, with the remark that, "she is a splendid cow when she is in flesh, or before calving, but that as soon as she calves, she runs all to milk, and becomes as poor as a crow." Now the fact is that the cow is really a valuable animal probably, and is willing to do all that can be asked to be profitable. She has large organs for secreting milk, which will act while ever there is anything left for them to work upon, and when the food does not supply it, they draw upon the body. Such a cow as that is not rightly fed, hence the reason she becomes thin and loses flesh after calving. Her milk secreting organs are not supplied with all the material which they can use, and the consequence is that they use up the cow. Let us look at the speed with which they use it?

A cow that will weigh 800 pounds, ought to consume about 20 pounds of the best hay per diem to keep her so that she will neither gain nor lose, supposing she gives no milk, nor does any kind of work whatever. Now a cow that gives ten quarts of milk per day, it is evident, ought to have enough food over and above that, *of the right kind*, to enable her to furnish that quantity of milk. What is the food which will do that? The composition of the milk will tell. Milk, according to the analysis of Haidlen, which is the best known, contains in 1000 parts:

Water	873.00
Butter	30.00
Casein	48.20
Milk Sugar	43 90
Phospate of Lime	2.31
Mineral Matters	2.59
	1000.00

So that in 10 quarts or 20 pounds of milk we would have of solid matter, 2.60, which would be composed as follows:

Butter	0.625	lbs.
Casein	1.000	"
Milk Sugar	0.875	"
Phosphate of Lime	0.045	"
Mineral Matters	0.055	"
	2.6	

In addition therefore to the 20 pounds of hay, there should be fed to the cow, substances containing from 25 to 30 per cent. of materials which will easily form the above elements, and which also will be so palatable that she will be induced to consume them readily. As an instance of the truth of this, we give the result of an experiment made with three cows which calved about the same time, and were each treated differently.

No. 1. On the 1st of January or about three weeks after calving, gave 15½ quarts of milk per day, and weighed 980 pounds She was fed 28 pounds of hay per day, and in nine weeks lost 84 pounds of flesh, and fell off to 9½ quarts of milk per day.

No. 2. At the same date gave 12 quarts, and weighed 840 pounds. She was fed 18 pounds of hay 45 pounds of turnips, and 9 pounds of ground oats for four weeks, when the ration of ground oats was discontinued.

Then she lost in both flesh and milk, and at the end of nine weeks, she lost 28 pounds of flesh, and gave but 6¼ quarts of milk.

No. 3. Gave 15½ quarts of milk per day and weighed 1092 pounds. She was fed, with a steamed mixture of cut hay and straw, oat chaff, turnips, bran, meal and rape cake, which actually cost less than the feed of No. 2, by about 20 cents for the nine weeks. At the end of the trial she had gained in flesh 56 pounds, and her milk averaged 12½ quarts per day.

To keep a cow fully up to her milk, rating it at 10 quarts per day, it has been estimated, that it would need over and above the amount of hay required for her necessary maintenance, 10 lbs. of hay to supply the casein, and 20 lbs. to yield the oleaginous elements for the butter, and 4½ lbs. for the supply of the phosphoric acid and other minerals. No cow could eat hay enough to supply the amount, and therefore, if we would have them fully profitable, they must be fed on other materials. It must be borne in mind also, that where butter is the manufactured article, the substances used may very much promote a supply of milk yielding a large proportion of butter.

So convinced was an English gentleman, named Horsfall, of this fact, and of the importance of keeping up his milch cows in flesh, so that he might not lose, after calving, the flesh which they had made previous to that time, that he instituted a number of experiments, and found that when his milch cows were kept up in flesh, their cream was worth nearly twice as much as that yielded by ordinary milk for the purposes of making butter.

For instance, good milk of more than ordinary quality will seldom yield over one ounce of butter to a quart of milk, and when the cream is taken, the richest known yield is at the rate of 14 ounces of butter to a quart of cream, but more generally it seldom exceeds 9 or 10 ounces to the quart. Mr. Horsfall found that by his mode of feeding, his cream would yield from a quart from 22 to 25 ounces of butter, and from the milk he got at the rate of 25 ounces of butter to every 40 pounds.

To obtain such results, however, Mr. Horsfall, found that he must feed his cows on food that besides sustaining the animal, would also contain a surplus of the elements of curd, of butter, and of bone, sufficient for the formation of the quantity of milk which the cow was in the habit of giving, or in other words the rations of food must contain casein, olein and phosphates, not only sufficient to supply the natural waste of the animal, by keeping up its muscles, its bones and its respiration, but also to enable it to give milk to the utmost powers of its secreting organs, fully saturated with the particles of butter.

He found that a cow could not possibly consume, were she to keep her jaws moving for the whole twenty-four hours, a quantity of either hay or turnips sufficient to produce milk or butter in such amount as would render the keeping of cows profitable, and that he must rely upon other articles of food, in the composition of which there were the requisite elements.

After various trials of different substances and mixtures, it was found that one of the most economical compounds, with regard to results, and value of the materials, was formed from rape cake, 5 pounds, bran 2 pounds, for each cow, mixed with a sufficient quantity of cut bean straw, and oat chaff, to supply each animal with three meals of as much as it would eat. This mixture was steamed, and with it was fed likewise, a pound of bean meal, 25 pounds of turnips or mangle wurzels and after each meal 4 pounds of hay.

The bean straw mentioned above, it may be well to note, is not the stalks of our field beans, but of the variety known as the Windsor bean. When dry, this straw is about as palatable as buckwheat straw, but when steamed " it becomes soft and pulpy, emits an agreeable odor, and imparts flavor and relish to the mess." It is not by any means equal to our corn stalks as a substance for feed, and we believe were corn stalks treated in the same way, they would prove more valuable. The rape cake used, is the remains of the seed of the cole wort or rape plant after it is pressed for its oil. The cole or rape plant is a vegetable of the turnip species, the seed of which is very rich in oils. The oil made from this seed is principally used for burning, and contains a large proportion of this fatty matter, as much as 10 per cent., besides nearly 40 per cent. more of starch, sugar and gum, all of which yield 50 parts of fat to every 90.

Heifers fed in this way, not giving milk, and dry cows intended for the butcher, increased fourteen pounds each per week, and sometimes even more, or at the rate of two pounds per day.

If we compare this kind of feeding with the treatment our milk cattle usually get during the winter, we will easily perceive the profit of one system and the want of profit in the other.

A milch cow that receives 20 pounds of the poorest quality of hay, and 8 quarts of bran per day, is considered as very well taken care of, not one half the cows in this State receive as much. Such hay is worth $6 per ton, and the bran is now sold at $8 per ton; it is therefore easy to calculate the cost of keeping a cow as being worth about eight cents per day, for the hay feeding is worth six cents and the bran estimated as averaging half a pound to the quart is worth nearly two cents. In return, the cow yields probably from four to six quarts of milk per day. Take the largest amount, and allowing each quart of milk to yield an ounce of butter, and we have as the daily return of the cow, 6 ozs. of butter, which at eighteen cents per pound, is worth 6¾ cts., exactly. The manure, and the skim milk, we allow as paying for the work of feeding, and the labor of manufacturing the butter. There would be a loss therefore on each cow of 1¼ cent per day, which in a dairy of six cows, kept at this rate, and averaging this amount of produce, for a whole winter, of 160 days, would amount to twelve dollars. We think this a moderate computation, and that the loss more generally reaches twice that amount, especially when it is considered that there is hardly a dairy in the State in which there are six cows that will average four quarts apiece per day for the whole of the winter, even on a better supply of food than that above noted.

In illustration of an extraordinary instance of feeding, and its profits, we give the following from a letter we received from Mr. Becket Chapman, of South Boston, Ionia County:

"In the winter of 1856, I fed one cow one and a half bushels of Indian meal and one and a half bushels of bran per week, besides what hay she would eat. She made eight pounds of butter per week. Corn was worth fifty cents per bushel, and bran 50 cents per 100 lbs. Butter sold at 25 cents.

"In the winter of 1857, I fed a cow six quarts of Indian meal scalded per day, with good hay *ad libitum*, good stable and plenty of litter. She made 10 lbs of butter per week. Corn was worth 75 cents per bushel, and butter 25 cents per pound. Will the editor please let us know if corn can be used to more advantage?"

We regret that Mr. Chapman has not given us some idea of the weight and value of hay he fed to his cows, but calling it 16 pounds per day, and worth $8 per ton, and we have the result per week as follows:

FIRST YEAR.

Hay, 112 lbs. at $8 per ton,	$0.45
Corn Meal at 50 cts. per bushel for corn,	0.90
Bran at 50 cts. per 100 lbs.,	0.25
	$1.60
Butter made 8 lbs. at 25 cts.,	2.00
Leaving as a profit per week,	,40

SECOND YEAR.

Hay, 20 lbs. per day at $8 per ton,	$0.56
Indian Meal, 42 quarts, corn at 75 cts.,	1.13
	$1.69
Produce, 10 lbs. of butter per week at 25 cts.,	2,50
Profit per week,	$0.81

It will be noted that after allowing four pounds of hay per day to make up for the want of the bran, the scalding of the meal seems to give a profit of 81 cents plus the increased price of the corn and the value of the six quarts saved, making altogether a difference of 88 cents in favor of the cooked food, and valuing the feed at the same rates as those of the year before, a profit per week of $1.18 from a single cow.

Though we do not think this the most profitable mode of feeding milk cows, yet, it is a fair illustration of the fact that cows will pay better to be kept right, than to have them uncared for and only half fed up to their work.

We call the attention of the butter-makers, and the keepers of milk stock to the facts set down here as worth their consideration. If any of them do better, and we have understated or underrated, any part of the subject, we are open for correction. Let the farmers give us facts, facts that come from the weighing beam,—we shall be pleased to receive them, the earlier the better as we shall have more to say on this subject.

Virginia State Agricultural Society.

SEVENTH ANNUAL MEETING.

Agreeably to the adjournment of the last Farmers' Assembly, a meeting of members elect for the present year assembled at the Market Street Baptist Church, in the city of Petersburg, on Monday Afternoon, the 1st of November, 1858.

It being manifest that no quorum was present, the meeting adjourned until Tuesday, the 2nd instant, at half-past 4 o'clock, P. M.

Tuesday, Nov. 2nd, 1858.

At half past four o'clock the meeting assembled at the same place. The Secretary of the Virginia State Agricultural Society called the meeting to order, and proceeded to call the roll to ascertain whether or not a quorum was in attendance. Forty-four members were found to be present, sixty-five being necessary to constitute a quorum, the meeting again adjourned to half-past seven o'clock, P. M.

At half-past seven o'clock the Secretary again called the meeting to order, and proceeded as heretofore to ascertain the number in attendance, when the calling of the roll was arrested by a motion made, and put to the vote of the meeting by Mr. Cox, of Chesterfield, by which vote Col. Thomas M. Bondurant was elected Chairman of the meeting *pro tempore*. The Secretary of the Society was then requested to act as Clerk. The calling of the roll was resumed, and it appearing that but forty-five members were present, the meeting adjourned until Wednesday morning, 9 o'clock.

Wednesday, Nov. 3rd, 1858.

The meeting assembled agreeably to adjournment, Col. Bondurant in the Chair.

Mr. Wickham, of Hanover, offered the following resolution:

Resolved, That the Farmers' Assembly is now in Session.

Pending the discussion on this resolution, on the motion of Mr. Booth, of Nottoway, the meeting adjourned until half-past seven o'clock this evening.

At half-past seven o'clock the meeting again assembled, Col. Bondurant in the Chair.

The resolution of Mr. Wickham, of Hanover, being the first business in order, was taken up, when, on motion of Mr. Garnett, of Westmoreland, it was laid upon the table. Mr. Garnett then moved the adoption of the following resolution, which was carried in the affirmative:

Resolved, That the Secretary do now proceed to call the roll, to ascertain whether there be a quorum present, of the Farmers' Assembly.

The roll was accordingly called, and there being found present but forty-five members, it was, on motion,

Resolved, That this meeting do now adjourn *sine die*.

After the final adjournment of the meeting, the Secretary distributed among the members elect the following annual report of the Executive Committee to the Farmers' Assembly, with the accompanying documents, which, through the courtesy and respect due to the Assembly, had been withheld, so long as there remained a hope of effecting an organization.

Annual Report of the President and Executive Committee.

Members of the Farmers Assembly:

At your last session, in 1857, and by your several special orders sundry duties were entrusted to the Executive Committee, and which were thus required to be finally decided upon and completed by that Committee. What has been done, or failed to be effected in these cases will be first presented to your notice.

The President and Executive Committee, in their last Annual Report, had referred to the heavy expenditures attending the Society's exhibitions as a growing evil, and to the efforts then made to restrain them. The partial success of those efforts may be seen on reference to the accompanying document, (A.)

The policy of holding our Fairs at Richmond, upon an advance by the City, of an inadequate sum of money, had drawn so heavily upon the contingent or surplus fund of the Society, that if we had held the present Fair there, that surplus fund amounting originally to about $5,000, which was reduced in 1857 to $3,000, would have been entirely exhausted, and, in addition, a debt incurred which could only have been paid out of the fixed capital of the Society.

The first clause of the 11th section of the Constitution provides that, "All capital of the Society, now or hereafter invested, shall be held a fund sacred to the cause of Agricultural improvement, of which the income only shall be subject to appropriation."

This made it imperative upon the Executive Committee to procure from the City, or citizens, of Richmond, an adequate guarantee that the expenditures for holding the present Fair should not exceed the income subject to appropriation, and that the accommodations therefor should be commodious and in proper repair. And as the Constitution requires that "The Society shall hold an Annual Exhibition, Cattle Show and Fair, at such time and place as the Farmers Assembly shall designate, or in default thereof as may be designated by the Executive Committee," the President and Executive Committee brought their difficulties to the attention of the Farmers Assembly, in the following passage in their last Annual Report: "The ground allowed to the Society for the Annual Fair and Exhibition, is insufficient in space and accommodations. The Executive Committee, for the last two years have encountered much difficulty to make up for the actual deficiencies—and in vain efforts to obtain a suitable and permanent location. On this account also, the expenses of the Society have been much increased. It is absolutely necessary that these disadvantages shall be removed, by some proper and permanent arrangement, in the ensuing year, even if a necessary condition for relief shall be a removal of the Fair to some other location, either neighboring or remote." As the Constitution devolved on the Farmers Assembly the duty of designating a place for the Annual Fair, and in default thereof made it the business of the Executive Committee to supply their omission, it was earnestly hoped that this responsibility would have been taken by the Farmers Assembly. The subject was referred to a special committee of that body, who asked to be discharged from its further consideration, and that it should be referred back to the Executive Committee. This course was adopted by the Farmers Assembly, and left the Executive Committee no alternative but to raise the necessary funds in Richmond, or to appeal to the liberality of some other city. The accompanying document (B) will show what the Executive Committee considered it their duty to do under these circumstances. From that, it will appear that the City of Richmond declined to render such aid as the Executive Committee felt compelled to require, whilst the City of Petersburg, under the lead of the Union Society, of Virginia and North Carolina, proposed terms whose generosity entitles them to the thanks of the Virginia State Agricultural Society. These terms, as is apparent, were accepted; and the Society is accordingly convened in Petersburg.

If this change of locality is to be the commencement of a new system as to the terms on which the Fairs of the Society are to be held, it has at least one advantage in the precedent it affords, by which it shall be a fixed condition that the city or town having the benefit of the Fair will contribute an amount sufficient to enable the Society to hold it without violating the provisions of the Constitution.

Having thus concisely stated the grounds of their action, which are hereby respectfully submitted to the Farmers Assembly, the Executive Committee will cheerfully receive their instructions as to any further action upon the subject.

Acting under either the special or virtual instructions of the Farmers Assembly, and in continuation of the still earlier adopted and continued policy of the State Agricultural Society, the Executive Committee endeavored to obtain from the General Assembly of the Commonwealth, the enactment of several measures required for the improvement and profit of agriculture, and for the removal of existing burdens and grievances. Among these, the principal objects sought, were, pecuniary aid to the State Society—relief from the worst, and only the useless as well as oppressive features of the general fence law (and so far only in the main respects, as to be sought for and accepted by voluntary agreement in particular neighbourhoods,)—and relief from the inspections of manures, which are taxes on agriculture and of no benefit whatever except to supply fees to the inspectors. Neither of these measures of benefit or relief to agriculture has ever been fully considered or finally determined upon by the Legislature.

The subject of the offer to the Society by Col. Philip St. George Cocke, of the Belona Arsenal property at the price with interest at which he had bought it, on the condition of there being established there by the Society an Agricultural Institute, or school, was referred by your body to the Executive Committee and was promptly and deliberately considered and acted upon. The reasons of the Committee for declining the offer are set forth in the accompanying abstract (C) from the Journal of the Executive Committee.

The expenditures of the last year, (1857) not known or nearly completed at the time of the last Annual Report, though still much too large, are considerably curtailed in their total amount by different measures of improved economy. Yet, in the expenditures for that year, was included, the amount paid for printing the transactions of the Society, which before had been two years in arrear, and bringing the publication up to the latest time—which is now the established policy. But with all the attempts made to reduce expenses, still, (as shown in the papers A and B.,) the expenses of the year and Fair of 1857, much exceeded the income and receipts of the Society—as the expenses of 1858 would have done, but for the change of location and of the system. Thus it has been, and would have continued, that the expenses of the Annual Fairs, added to other minor and indispensable expenditures, would have been more than enough to absorb all the income and available means of the Society, leaving, as heretofore, not a dollar to devote to any other mode of increasing agricultural knowledge, or promoting agricultural interests. In that case, all that has yet been done, or could be done, by fairs alone, would be but a poor result from its means. We would be among the last to depreciate the very important utility and benefits of great agricultural fairs, and the crowds of visitors attracted to them, consisting of the best population of our country. We would not abate a word of what was said in the last Annual Report, in eulogizing the social and general benefits of such fairs and meetings as this Society has heretofore held. But highly valuable as such fairs are—and more so for their indirect and remote benefits than for their direct and immediate influence on agriculture, yet it is very certain, that the holding of fairs and exhibitions is neither the only nor the most effective means, by which our Society can, with its funds, promote instruction in, and the improvement and progress of agriculture. And should it be a necessary result of removal to different, or even always changing localities for the Annual Fairs, and the requiring that the fairs shall defray their proper expenses, that their particular benefits shall be greatly reduced, such change will at least leave the Society free, and able, to devote its income, so released, to the amount of some $3,000 annually, to other measures for aiding agricultural instruction and improvement. There are many such measures that might be judiciously and profitably put in action. Without designing to indicate any of these as the best, or deserving the earliest preference, we will refer, in general terms, to two only of such measures, both of unquestionable utility, if judiciously planned and executed, and either of which might be so extended as to absorb most beneficially for agriculture, much more than all that this Society can thus be enabled to pay for any such objects.

One of the measures referred to, is one which has already much engaged the attention and interest of the Society, and which was first brought forward in the General meeting of 1854, and discussed then and subsequently, and was proposed, at first, for the adoption and support of this Society and by its funds. This is the endowment of an agricultural professorship at the University of Virginia—or, it may be, more than one, if aided by other funds, and the liberality of the people of Virginia.

Other and not less important measures would be, the cautious and limited beginning of Geological and Agricultural Surveys and reports thereupon, either for separate counties or for any other stated and limited spaces of territory. The importance of a geological survey will not be over-estimated; and the effect of a proper agricultural and statistical survey, similar in plan to the truly great work formerly conducted under the direction of the British Board of Agriculture, may be estimated from the influence of that work on the agriculture of England.

The carrying through in any specified time of a system so great and complete, for the whole territory of Virginia, could not be effected, nor even thought of as a result to be produced by our spare funds, and with all the available aid in prospect. Neither would it be necessary, nor desirable, for the whole operation to be in progress at once, or to be completed, generally, in any early time. Even if funds were now abundant for the purpose, the much larger portion of the State is not yet ready for the undertaking—and but a small portion of our people would yet appreciate the benefit, or be desirous, or even ready to profit fully by agricultural surveys and investigations. But certainly there are now some counties, or other localities, already enough advanced in agricultural improvement to be greatly benefited by these measures, and whose cultivators would so highly appreciate the benefits, as to be willing to pay half the necessary expense—and also by other aid and information to forward the labors of the examiners and reporters of agricultural resources, merits, deficiencies and errors, of the several districts. If, for example, this Society chose to offer $1000, by an appropriation, for this object, and as a beginning and working of the plan, the appropriation should be offered in separate sums of $250 to each of the first four localities, (of any stated limits) that would severally advance an equal amount, to employ and pay well-qualified persons to examine and report fully upon the several sections of territory. In this manner, by the Society's offering $250, as much more would be added thereto from private contributions—or in default thereof, no expense would be incurred. There could be no contest, or struggle, for different places to have preference of selection, and the first benefits of surveys, because the designation would be made in the order of time in which offers of equal pecuniary aid would be made to the Society. No county would be thus examined, and its agriculture reported upon, that did not care enough for the benefit to be willing to pay half the expense. And the reports made of even a few of the most improved counties, in detached parts of the State, by as many different competent examiners, would serve not only to benefit the several counties, as it would principally, but also as instruction for all other lands of similar characters, or having like facilities for improvement and good management. The early labors of this kind would serve to prepare for and facilitate any succeeding surveys. And if, by possibility, there should be either failure or disappointment, in the results, the system could be suspended, or abandoned, at the close of the first, or of any later years' operations, without leaving any incumbrance for the future on the funds, or any obstacle to subsequently better devised plans and efforts of the Society, for its great object, the improvement of agriculture throughout the territory of Virginia.

At the meeting of the Farmers Assembly in 1856, the Executive Committee was required "to cause to be made a marble bust and a portrait of Philip St. George Cocke, Esq., to be bestowed as this body shall hereafter determine." The Executive Committee appointed William Boulware, Wm. H. Macfarland and R. H. Dulany, Esqrs., a committee to consult with Col. Cocke, and make necessary arrangements for having his bust and portrait made, in accordance with those instructions. The portrait has been completed by a distinguished artist, and is now in the possession of the Secretary of the Society, subject to the order of your body; and the causes which delayed the action of the Committee in the further execution of those instructions are set forth in their report, marked (D.)

The Committee take great pleasure in acknowledging the receipt, through the Hon. Wm. Ballard Preston, of Montgomery, of sixty-one valuable works on French Agriculture, which have been kindly tendered to the Society by M. Monny de Mornay, Director of the Department of Agriculture in France; and they have instructed their President to acknowledge, in suitable terms, their high appreciation of the valuable gift, and of the liberal spirit which prompted the gift. (See document E.)

By the Constitution of the Society, it is made the duty of the Executive Committee to arrange all the counties, cities and towns of Virginia, in which there are known resident Members of the Society into Electoral Districts, for the Election of Members of the Farmers' Assembly. By the recent arrangement there are sixty-nine Electoral Districts and one hundred and twenty-eight Members of the Farmers' Assembly.

The Treasurer's report and accounts (marked F) will be herewith submitted; also the entire journal of proceedings of the Executive Committee for the past year and for the preceding years.

By order of the Executive Committee.

EDMUND RUFFIN,
President of the Virginia State Agricultural Society.

(A)

Expenses and Receipts of Annual Fairs since 1853.

EXPENSES—1853.

Incidental expenses, including advertising, Forage, &c.	$2,145 97

RECEIPTS.

Donation Madame Sontag	$ 100 00
Gate Fees	1,947 17
	$2,047 17

The police department paid by the city, a large part of the service being gratuitous.

EXPENSES—1854.

Incidental expenses	$1.311 32
Printing and advertising	215 62
Forage department	1.297 97
Police department	2.591 20
	$5.416 11

RECEIPTS.

Gate Fees	$3.289 50
Rents	200 00
Badges	707 30
City of Rich'd for police	1.000 00
	$5.196 80

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EXPENSES—1855.

Office expenses		$ 338 78
Incidental	1.606 59	
Off expense of plate, &c.	535 00	1.071 59
Printing and advertising		263 50
Ticket office		130 75
Police department		2.807 24
Forage department		1.241 33
Repairs to Fair Grounds		593 54
		$6.446 73

RECEIPTS.

Gate Fees	$2.505 76
Badges	551 32
Rent	400 00
	$3.457 08

—

EXPENSES—1856.

Office expenses	$ 396 78
Printing and advertising, of which 447 for Farmers' Assembly	694 74
Incidental expenses	1.065 58
Ticket office	116 12
Police department	2.658 75
Forage department	958 97
Repairs to Fair Grounds	949 11
Rent of horse lot	500 00
	$7.340 05

RECEIPTS.

Gate Fees	$2.370 31
Badges	365 44
Rents	250 00
J. P. Ballard's donation on account of horse lot	166 67
	$3.152 42

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EXPENSES—1857.

Office expenses	$ 96 67
Incidental expenses	654 76
Ticket office	86 00
Police department	1.849 50
Forage department	968 95
Repairs to Fair Grounds	630 90
Rent of horse lot	1.000 00
	$5.286 78

RECEIPTS.

Rents	$ 445 00
Gate Fees	2.843 62
City of Richmond for horse lot	1.000 00
	$4.288 62

The above statement shows the incidental receipts from the holding of the Fairs, and the incidental expenses attending them, except the premiums.

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(B)

Refers to proceedings of the Executive Committee on the 27th November, 1857—the 27th of January following, and on the 27th of April, 1858, all which were contained in a card published by the Secretary in the October number of the Southern Planter, page 593.

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(C)

At a meeting of the Executive Committee of the Virginia State Agricultural Society on the 26th of November, 1858, the following report was submitted by Mr. Knight and unanimously adopted:

The committee appointed to visit the Belona Arsenal property "to ascertain its condition, cost, the expense of establishing an Agricultural School thereat, and the expediency of accepting the property with that view" report: That they have visited the place, and made a full examination of the buildings, and found them to be in a very dilapidated condition, and in view of their condition and their arrangement, consider them unfit for the purposes of a school. They have not deemed it necessary to make an accurate estimate of the cost of repairs of the buildings, and of such alterations as would be needful to adapt them to the accommodation of a school, because it is very apparent that it would require an amount far beyond the present means of the Society. The committee, therefore, respectfully report against the expediency of accepting the property on the terms on which it has been tendered to the Society.

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(D)

The committee appointed to have a portrait, and also a bust, prepared of the late President of the Society, Col. COCKE, report: That they contracted with Maurince Guillaume, a distinguished artist, for the portrait, and that it has been executed, and is now in the possession of the Secretary of the Society, at the Society's rooms, in the city of Richmond. They report further, that nothing has been done in reference to the bust, because it is believed it cannot be well executed in this country. * * *

WM. BOULWARE.

October 29, 1858.

(E)

Smithfield, 26th Oct., 1858.

To the President of the
Agricultural Society of Va.:

Sir:—During a visit last year to Paris, I had the gratification of forming an acquaintance with the Honorable de Monny de Mornay, Director of the department of Agriculture for France.

Ardently devoted to agriculture as an elevated science and ennobling art, its chief direction in that great empire is entrusted to his care. His administration is characterized by wise and salutary measures for its improvement within his own country, as well as a comprehensive and liberal spirit, that anxiously seeks to diffuse the benefits and blessings that science, knowledge and skill are constantly contributing toward its promotion.

In this spirit, and as a testimonial of the kind consideration and regard in which he holds our venerable Commonwealth, he requests me to present for him to the Agricultural Society of Virginia, a collection of works on agriculture, from the department over which he presides.

In his name I now present them to the Society, and in his behalf pray you will accept them. The collection consists of sixty-one volumes and pamphlets, accompanied by memoirs, beautiful and elegant engravings, illustrative of the various subjects treated of in the volumes, together forming a good collection of the best works on agriculture and horticulture recently published in France.

A catalogue is also furnished prepared by Mr. Alexander Vattemere, always active and distinguished in whatever contributes to the intellectual union or harmony of nations.

With high consideration and respect,
I am your ob'nt ser't,

WM. BALLARD PRESTON.

(F)

The Treasurer's Account.

Virginia State Agricultural Society,
In account with Ch. B. Williams, Treasurer.

Receipts within the year.

Donation of J. P. Ballard for rent (in part) of horse lot for 1856, .	166 67
Donation from City of Richmond ditto for 1857, ...	1.000 00
Withdrawn from City Savings Bank,	1.400 00
Bills collected for forage department,	28 51
Interest account, ...	2.836 50
Permanent Fund Col. Townes 4th installment of his donation, . .	100 00
Permanent Fund for one life membership, ...	20 00
Contingent Fund, annual memberships, ...	3.913 26
Contingent Fund, paid by W. C. Rives, Esq., premium offered by him, ...	15 00
Contingent Fund, received for auction fees, ...	3 50
Contingent Fund, rent of booths, .	445 00
Contingent Fund, gate money and premium, ...	2.843 62
Contingent Fund, sale of transactions,	4 00
Balance on hand per last settlement,	1·972 74
	$14.748 80

Disbursements within the year.

On account of premiums of 1854, ...	15 00	
Premiums of 1856, .	37 00	
Premiums of 1857, .	3.896 50	
Expenses of 1856–7, .	94	
Rent of horse lot 1856, .	216 51	
Rent of horse lot 1857, .	976 49	
Salary of Secretary, .	1.500 00	
Office expenses, . .	408 92	
Printing and advertising, ...	1.242 42	
Incidental expenses, .	654 76	
Ticket office, . .	86 00	
Police Department, .	1.849 50	
Forage Department, .	997 46	
Repairs of Fair Grounds,	632 90	
Returned to Members twice p'd $3, counterfeit $5, . . .	8 00	
Discount on uncur't fds.	4 48	
Deposit'd with City Savings Bank, . .	1.000 00	13.526 88
Balance,		$1.221 92

List of balances on 30th September, 1858.

Contingent Fund, . .		48.089 02
Permanent Fund, . .		46.364 00
Rent of horse lot 1857 (unclaimed,) . . .		23 51
Interest account, . .		9.907 20
Cash, ...	1.221 92	
Virginia State stock, .	500 00	
Richmond City stock, .	44.750 00	
Am't carried forward,	$46.471 92	$104.383 73

Am't brought forward,	$46.471 92	$104.383 73
Premiums of 1853,	. 3.353 00	
Premiums of 1854,	. 3.843 50	
Premiums of 1855,	. 3.731 00	
Premiums of 1856,	. 3.805 60	
Premiums of 1857,	. 3.696 50	
Expenses of 1853–4,	. 3.864 24	
Expenses of 1854–5,	. 7.456 77	
Expenses of 1855–6,	. 8.958 44	
Expenses of 1856-7,	. 8.877 34	
Expenses of 1857–8,	. 7.343 45	
Rent of horse lot 1858,	162 37	
City Savings Bank,	. 2.600 00	
	$104.383 73	$104.383 73

GENERAL MEETING OF THE SOCIETY.

After the final adjournment of the meeting of the members elect of the Farmers Assembly on Wednesday the 3d of November, the members of the State Agricultural Society organized themselves into a general meeting for the discussion of subjects relating to the state and prospects of the Society. John R. Edmunds, Esq., was called to the chair.

On motion of Mr. W. C. Knight, of Nottoway,

Resolved, That a Committee be appointed to wait upon the Union Society, now in Session, and invite them to unite in the proceedings of this meeting. Committee—Messrs. Knight, Newton, and Garnett, of Henrico.

On motion of Mr. Seddon, after various propositions of amendment, and a free discussion, in which the members of both Societies participated, the following resolution was adopted with but two or three dissenting voices:

Resolved, That it be recommended to the Executive Committee of the State Agricultural Society to confer with the Executive Committee of the Union Agricultural Society on the practicability of a permanent union of the two Societies, and if found practicable, to report the terms of such union to the next meeting of the State Agricultural Society, or to the next Farmers' Assembly, as they may deem judicious.

The meeting then adjourned.

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THURSDAY NIGHT, Nov. 4th, 1858.

The members of the Union Agricultural Society of Virginia and North Carolina, and of the Virginia State Agricultural Society, convened in joint meeting at the Market Street Baptist Church, at half-past seven o'clock, to hear the Annual Address.

The President introduced Professor Holcombe, of the University of Virginia, who had been invited by the Executive Committee to address the meeting on an interesting branch of the general subject of slavery:—"*The right of the State to institute Slavery, considered as a question of Natural Law, with special reference to African Slavery as it exists in the United States.*"

Professor Holcombe then delivered the following discourse:

Mr. President, and

Gentlemen of the Agricultural Society:

It seems to me eminently proper, to connect with these imposing exhibitions of the trophies of your agricultural skill, a discussion of the whole bearings and relations, jural, moral, social, and economical, of that peculiar industrial system to which we are so largely indebted for the results that have awakened our pride and gratification. No class in the community has so many and such large interests gathered up in the safety and permanence of that system as the Farmers of the State. The main-wheel and spring of your material prosperity, interwoven with the entire texture of your social life, underlying the very foundations of the public strength and renown, to lay upon it any rash hand would put in peril whatever you value; the security of your property, the peace of your society, the well-being—if not the existence of that dependent race which Providence has committed to your guardianship—the stability of your government, the preservation in your midst of union, liberty, and civilization. By the introduction of elements of such inexpressible magnitude, the politics of our country have been invested with the grandeur and significance which belong to those great struggles upon which depend the destinies of nations. The mad outbreaks of popular passion, the rapid spread of anarchical opinions, the mournful decay of ancient patriotism, the wide disruption of Christian unity, which have marked the progress, and disclosed the power, purpose and spirit of this agitation, come home to your business and bosoms with impressive emphasis of warning and instruction. No pause in a strife around which cluster all the hopes and fears of freemen, can give any earnest of enduring peace, until the principles of law and order which cover with sustaining sanction all the relations of our society, have obtained their rightful ascendency over the reason and conscience of the Christian world.

The most instructive chapters in history are those of opinions. The decisive battle-fields of the world furnish but vulgar and deceptive indices of human progress. Its true eras are marked by transitions of sentiment and opinion. Those invisible moral forces that emanate from the minds of the great thinkers of the race, rule the courses of history. The recent awakening of our Southern mind upon the question of African Slavery, has been followed by a victory of peace, which, we trust, will embrace within its beneficent influence generations and empires yet unborn. Such was the strength of anti-slavery feeling within our own borders, that scarcely a quarter of a century has elapsed since an Act of Emancipation was almost consummated, under the auspices of our most intelligent and patriotic citizens; a measure which probably all would now admit bore in its womb elements of private distress and public calamity, that must have impressed upon our history, through ages of expanding desolation, the lines of fire and blood. But

"Whirlwinds fitliest scatter pestilence."

Nothing less than an extremity of peril could have induced a general revision of long-standing opinions, intrenched in formidable prejudices, and sanctioned by the most venerable authority. Slavery was explored, for the first time, with the forward and reverted eye of true statesmanship, under all the lights of history—of social and political philosophy—of natural and Divine law. Public sentiment rapidly changed its face. Every year of controversy has encouraged the advocates of "discountenanced truth" by the fresh accessions it has brought to their numbers, whilst no desertions have thinned the enlarging ranks. The celebrated declaration of Mr. Jefferson, that he knew no attribute of the Almighty which would take the side of the master in a contest with his slave, is so far from commanding the assent of the intelligent slaveholders of this generation, that the justice, the humanity, and the policy of the relation as it exists with us, has become the prevailing conviction of our people. Public honours, and gratitude, are the fitting meed of the statesmen, whether living or dead, (and amongst them I recall no names more eminent than those associated with the proudest traditions of this hospitable and patriotic city, Leigh, Gholson, and Brown,) who threw themselves into this imminent and deadly breach, and grappling with an uninformed and unreflecting sentiment, delivered the commonwealth, when in the very jaws of death, from moral, social and political ruin. Permit me to premise some words of explanation as to the meaning and extent of the subject upon which I have been invited to address this meeting. It presents no question of municipal or international law. It raises no inquiry as to the rightfulness of the means by which slavery was introduced into this continent, nor into the nature of the legal sanctions under which it now exists. There can be no doubt that slavery, for more than a century after it was established in the English colonies, was in entire harmony with the Common Law, as it was expounded by the highest judicial authorities, and with the principles of the Law of Nations, and of Natural Law as laid down in the writings of the most eminent publicists. At the commencement of our Revolution men were living who remembered the Treaty of Utrecht, by which, in the language of Lord Brougham, all the glories of Ramillies and Blenheim were bartered for a larger share in the lucrative commerce of the slave trade. But whatever may be our present opinions upon these subjects, the black race now constitutes an integral part of our community, as much so as the white, and the authority of the State to adjust their mutual relations can in no manner depend upon the method by which either was brought within its jurisdiction. The State in every age must provide a constitution and laws, if it does not find them in existence, adapted to its special wants and circumstances. African Slavery in the United States is consistent with Natural Law, because if all the bonds of public authority were suddenly dissolved, and the community called upon to reconstruct its social and political system, the relations of the two races remaining in other respects unaltered, it would be our right and duty to reduce the negro to subjection. To the phrase Natural Law, I shall attach in this discussion the signification in which it is generally used, and consider it as synonymous with justice; not that imperfect justice which may be discerned by the savage mind, but those ethical rules, or principles of right, which, upon the grounds of their own fitness and propriety, and irrespective of the sanction of Divine authority, commend themselves to the most cultivated human reason. Slavery we may define, so as to embrace all the elements that properly belong to it, as a condition or relation in which one man is charged with the protection and support of another, and invested with an absolute property in his labour, and such a degree of authority over his person as may be requisite to enforce its enjoyment. It is a form of involuntary restraint, extending to the personal as well as political liberty of the subject. The slave has sometimes, as at one period under the Roman jurisprudence, been reduced to a mere chattel, the power of the master over the person of the slave being as absolute as his property in his labour. This harsh and unnatural feature has never deformed the relation in any Christian country. In the United States the double character of the slave, as a moral person and as a subject of property, has been universally acknowledged, and to a greater or less degree protected, both by public sentiment and by the law of the land. It furnishes a key to the understanding of one of the most celebrated clauses in our Federal Constitution, as all know who are familiar with the luminous exposition, given by Mr. Madison in the Federalist, of its origin and meaning. In our own State, amongst other proofs of its recognition, we may point to the privilege conferred upon the master of emancipating his slave, and to the obligation imposed upon him of providing for his support when old, infirm, or insane; to the enactments which punish injuries to the slave, whether from a master or stranger, as offences of the same nature as if inflicted upon a white person, and to the construction placed by our courts upon the general language of criminal statutes, by which the slave, as a person, has been embraced within the range of their protection; to the regulations for the trial of slaves charged with the commission of crime, which, whilst they exact the responsibilities of moral agents, temper the administration of justice with mercy, and to the exemption from labour on the Lord's Day, an exemption which is shown by the provision for the Christian slave of a Jewish master, to have been established as a security for a right of conscience. Indeed, he scarcely labours under any personal disability, to which we may not find a counterpart, in those which attach to those incompetent classes—the minor, the lunatic, and the married woman.

The statement of my subject presupposes the existence of the State. It thus assumes that there are involuntary restraints which may be rightfully imposed upon men, for the State itself is but the sum and expression of innumerable forms of restraint by which the life, liberty, and faculties of individuals are placed under the control of an authority independent of their volition? The truth that the selfishness of human nature, forces upon us the necessity of submitting to the discipline of law, or living in the license of anarchy, is too obvious to have required any argument in its support, in this presence. Until man becomes a law unto himself, society through a political organization must supply his want of self-control. Whether it may establish such a form of restraint, as personal slavery, cannot be determined until the principles upon which its authority should be exercised, have been settled, and the boundaries traced between private right and public power. The authority of the State must be commensurate with the objects for which it was established. Its function is, to reconcile the conflicting rights, and opposing interests, and jarring passions of individuals, so as to secure the general peace and progress. It proceeds upon the postulate, that society is our state of nature and that men by the primary law of their being, are bound to live and perfect themselves in fellowship with each other.

As God does not ordain contradictory and therefore impossible things, men can derive no rights from him which are inconsistent with the duration and perfection of society. The rights of the individual are not such as would belong to him, if he stood upon the earth like Campbell's imaginary "Last Man," amidst unbroken solitude, but such only as when balanced with the equal rights of other men, may be accorded to each, without injury to the rest. The necessities of social existence, then, not in the rudeness of the savage state, but under those complex and refined forms which have been developed by Christian civilization, constitute a horizon by which the unbounded liberty of nature is spanned and circumscribed.

This is no theory of social absolutism. It does not make society the source of our rights, which therefore might be conferred or withheld at its caprice or discretion, but it does regard the just wants of society, as the measure and practical expression of their extent. It is no reproduction of the exploded error of the ancient statesmen, who inverting the natural relations of the parties, considered the aggrandizement of the State, without reference to the units of which it was composed, as the end of social union. The State was made for man, and not man for the State, but the cöoperation of the State is yet so necessary to the perfection of his nature, that his interests require the renunciation of any claim inconsistent with its existence, or its value as an agency of civilization. It invades no province sacred to the individual, because the Divine Being who has rendered government a necessity, has made it a universal blessing, by ordaining a prëestablished harmony between the welfare of the individual and the restraints which are requisite to the well-being of society.

Unless there is some fatal flaw in this reasoning, men have no rights which cannot be reconciled with the possession of a restraining power by the State, large enough to embrace every variety of injustice and oppression, for which society may furnish the occasion or the opportunity. The social union brings with it dangers and temptations, as well as blessings and pleasures—and men cannot fulfil the law and purpose of their being, unless the State has authority to protect the community from the tumultuous and outbreaking passions of its members, and to protect individuals as far as it can be accomplished without prejudice to the community, from the consequences of their own incompetence, improvidence and folly. Such are the natural differences between men in character and capacity, that without a steady and judicious effort by the State to redress the balance of privilege and opportunity which these inequalities constantly derange, the rich must grow richer, and the poor poorer, until even anarchy would be a relief to the masses, from the suffering and oppression of society. Owing likewise to this variety of condition, and of moral and intellectual endowment, it is impossible to prescribe any stereotype forms admitting of universal application, under which the restraining discipline of law should be exercised. The ends of social union remain the same through all ages, but the means of realizing those ends must be adapted to successive stages of advancement, and change with the varying intelligence and virtue of individuals, and classes, and races, and the local circumstances of different countries. The object being supreme in importance must carry with it as an incident, the right to employ the means which may be requisite to its attainment. The individual must yield property, liberty, life itself when necessary to preserve the life, as it were, of the collective humanity. To these principles, every enlightened government in the world, conforms its practice, protecting men not only from each other, but from themselves, graduating its restraints according to the character of the subject, and multiplying them with the increase of society in wealth, population and refinement. We cannot look into English or American jurisprudence without discovering innumerable forms of restraint upon rights of persons as well as rights of property, as in that absolute subordination of all personal rights to the general welfare, which lies at the foundation of the law for the public defence, the law to punish crimes, and the law to suppress vagrancy; or in those qualified restraints by which the administration of justice between individuals, has been sometimes enforced, as in imprisonment for debt; or in that partial and temporary subjection of one person to the control of another, either for the benefit of the former, or upon grounds of public policy, presented in the law of parent and child, guardian and ward, master and apprentice, lunatic and committee, husband and wife, officer and soldiers of the army, captain and mariners of the ship. Whether we proceed in search of a general principle, which may ascertain the extent of the public authority by a course of inductive reasoning, or by an observation of the practice of civilized communities, we reach the same conclusions. The State must possess the power of imposing any restraint without regard to its form, which can be shown by an enlarged view of social expediency, or upon an indulgent consideration for human infirmity, to be beneficial to its subject, or necessary to the general well-being.

In the legislation of Congress for the Indian tribes within our territory, and in that of great Britain for the alien and dependent nations under her jurisdiction, we see how the public authority, as flexible as comprehensive in its grasp, accommodates itself to the weakness and infirmity of races, as well as of individuals. Upon what principles is the British government administered in the East? In 1833, on the application of the East India Company for a renewal of its charter, they were explained and defended by Macaulay in a speech which would have delighted Burke, as much by its practical wisdom, as its glittering rhetoric. An immense society was placed under the almost despotic rule of a few strangers. No securities were provided for liberty or property, which an Englishman would have valued. This system of servitude was vindicated, not on the grounds of abstract propriety, but of its adaptation to the wants and circumstances of those upon whom it was imposed. India, it was urged, constituted a vast exception to all those general rules of political science which might be deduced from the experience of Europe. Her population was disqualified by character and habit, for the rights and privileges of British freemen. In their moral and social amelioration, under British rule, was to be found the best proof of its justice and policy. It was a despotism no doubt, but it was a mild and paternal one: and no form of restraint less stringent could be substituted with equal advantage to those upon whom it was to operate. It has often occurred to me in reading those fervid declamations upon Southern slavery, with which this great orator has inflamed the sensibilities of the British public, that his lessons of sober and practical statesmanship, from which no English ministry has ever departed, might be turned with irresistible recoil upon their author. Was American slavery introduced by wrong and violence? India was "stripped of her plumed and jewelled turban," by rapine and injustice. Are the relations of England to India, so anomalous that it would be unsafe to accept generalizations drawn from the experience of other communities? History might be interrogated in vain, for a parallel to the condition of our Southern society. Are the Hindoos unfit for liberty? Not more so than the African. Is despotism necessary in India, because it is problematical whether crime could be repressed or social order preserved under more liberal institutions? The danger of license and anarchy would be far more imminent, from an emancipation of our slaves. If the statesman despairs of making brick without straw in the East, can he expect to find the problem easier in the West? Has the Hindoo improved in arts and morals under the beneficent sway of his British master? In the transformation of the African savage into the Christian slave, the relative advance has been immeasurably greater. The truth is, that the principles which lie at the foundation of all political restraint, may make it the duty of the State under certain circumstances, to establish the relation of personal servitude. All forms of restraint involve the exercise of power over the individual without his consent. All are inconsistent with any theory of natural right which claims for man, a larger measure of liberty than can be reconciled with the peace and progress of the society in which he lives. All operate harshly at times upon individuals. All are reflections upon human nature, are alike wrong in the abstract. Any is right in the concrete, when necessary to the welfare of the community in which it exists, or beneficial to the subject upon whom it is imposed. If society may establish the institution of private property, involving restrictions by which the majority of mankind are shut out from all access to that great domain which the author of nature has stocked with the means of subsistence for his children, and justify a restraint so comprehensive and onerous, by its tendency to promote civilization; if it may discriminate between classes and individuals, and apportion to some a larger measure of political liberty than it does to others; if it may take away life, liberty or property when demanded by the public good: if, as in various personal relations, it may protect the helpless and incompetent, by placing them under a guardianship proportioned in the term and extent of its authority to the degree and duration of the infirmity: why if a commensurate necessity arises, and the same great ends are to be accomplished, is its claim to impose upon an inferior race the degree of personal restraint which may be requisite to coerce and direct its labour, to be treated as a usurpation? The authority of the State under proper circumstances, to establish a system of slavery, is one question: the existence of those circumstances, or the expediency of such legislation is another and entirely distinct question. No doubt a much smaller capacity for self-control, and a much lower degree of intelligence must concur, to justify personal slavery, than would be sufficient to impart validity to other forms of subordination. No doubt the public authority upon this as upon every other subject, may be abused by the selfish passions and interests of men. But once acknowledge the right of society to establish a government of pains and penalties, for the protection of the individual and the promotion of the general welfare, then unless it can be shown that slavery can in no instance be necessary to the well being of the community, or conducive to the happiness of the subject, (a proposition which is inconsistent with the admission of all respectable British and American abolitionists that any plan of emancipation in the Southern States, should be gradual and not immediate;) once make this fundamental concession, and the rightfulness of slavery, like that of every other form of restraint, becomes a question of time, place, men and circumstances.

The people of the United States accepting without much reflection, those expositions of human rights embodied in the infidel philosophy of France, and glowing with that generous enthusiasm to communicate the blessings of liberty which is always inspired by its possession, have been disposed to look with common aversion upon all forms of unequal restraint. Ravished by the divine airs of their own freedom, they have imagined that its strains, like those heard by the spirit in Comus, might create a soul under the ribs of death. Forgetting the ages through whose long night their fathers wrestled for this blessing, they have regarded an equal liberty, as the universal birthright of humanity. Hence, as they have witnessed nation after nation throwing off its old political bondage, and in the first transports of emotion, "shedding the grateful tears of new-born freedom" over the broken chains of servitude, they have welcomed them into the glorious fellowship of republican States, with plaudit, and sympathy, and benediction. But, alas! the crimes which have been committed in the name of liberty, the social disorder and political convulsion which have attended its progress, if they have not broken the power of its spells over the heart, have dispersed the illusions of our understanding. What has become of France, Italy, Greece, Mexico, Spanish America? that stately fleet of freedom, which when first launched upon the seas of time, with all its bravery on, was "courted by every wind that held it play." A part has been swallowed up in the gulfs of anarchy and despotism—the rest still float above the wave, but with rudder and anchor gone, stripped of every bellying sail and steadying spar, they only serve,

"Like ocean wrecks, to illuminate the storm."

The melancholy experience of both hemispheres has compelled all but the projectors of revolution to acknowledge, that the forms of liberty are valueless without its spirit, and that an attempt to outstrip the march of Providence, by conferring it on a people unprepared for its enjoyments by habit, tradition, or character, is an indescribable folly—which instead of establishing peace, order and justice, will be more likely to inaugurate a reign of terror and crime in which civilization itself may perish.

If the justice or fitness of slavery is to be determined, like other forms of involuntary restraint, not by speculative abstractions, but by reference to its adaptation to the wants and circumstances of the community in which it is established, and especially of the people over whom it is imposed, it only remains that we should apply these principles to the question of African Slavery in the United States. I shall not defend it as the only relation between the races, in which the superior can preserve the civilization that renders life dear and valuable. This proposition can indeed be demonstrated by plenary evidence, and it is sufficient by itself to acquit the slaveholder of all guilt in the eye of morals. But if the system could be vindicated upon no higher ground, every generous spirit would grieve over the mournful necessity which rendered the degradation of the black man indispensable to the advancement of the white. Providence has condemned us to no such cruel and unhappy fate. The relation in our society is demanded by the highest and most enduring interests of the slave, as well as the master. It exists and must be preserved for the benefit of both parties. Duty is indeed the tenure of the master's right. Upon him there rests a moral obligation to make such provision for the comfort of the slave, as after proper consideration of the burthens and casualities of the service, can be deemed a fair compensation for his labour; to allow every innocent gratification compatible with the steady, though mild discipline, as necessary to the happiness as the value of the slave; to furnish the means and facilities for religious instruction; and to contribute, as far and fast as a proper regard to the public safety will permit, to his general elevation and improvement. For oppression or injustice, allow me to say, I have no excuse to offer. I am willing to accept the sentiment of the heathen philosopher, and to regard a man's treatment of his slaves as a test of his virtue. And whenever a slaveholder is found who so far forgets the sentiments of humanity, the feelings of the gentleman, and the principles of the Christian, as to abuse the authority which the law gives him over his slaves, I trust that a righteous and avenging public sentiment will pursue him with the scorn and degradation which attend the husband or father, who by cruel usage makes home intolerable to wife or child.

Personal and political liberty are both requisite to develop the highest style of man. They furnish the amplest opportunities for the exercise of that self-control which is the germ and essence of every virtue, and for that expansive and ameliorating culture by which our whole nature is exalted in the scale of being, and clothed with the grace, dignity and authority, becoming the lords of creation. Whenever the population of a State is homogeneous, although slavery may perform some important functions in quickening the otherwise tardy processes of civilization, it ought to be regarded as a temporary and provisional relation. If there are no radical differences of physical organization or moral character, the barriers between classes are not insurmountable. The discipline of education and liberal institutions, may raise the serf to the level of the baron.—Against any artificial circumscription seeking to arrest that tendency to freedom which is the normal state of every society of equals, human nature would constantly rise in rebellion. But where two distinct races are collected upon the same territory, incapable from any cause of fusion or severance, the one being as much superior to the other in strength and intelligence as the man to the child, there the rightful relation between them is that of authority upon the one side, and subordination in some form, upon the other. Equality, personal and political, could not be established without inflicting the climax of injustice upon the superior, and of cruelty on the inferior race: for if it were possible to preserve such an arrangement, it would wrest the sceptre of dominion from the wisdom and strength of society, and surrender it to its weakness and folly. "Of all rights of man," says Carlyle, "the right of the ignorant man to be guided by the wiser, to be gently and firmly held in the true course, is the indispensablest. Nature has ordained it from the first. Society struggles towards perfection by conforming to and accomplishing it, more and more. If freedom have any meaning, it means enjoyment of this right, in which all other rights are enjoyed. It is a divine right and duty on both sides, and the sum of all social duties between the two." Under the circumstances I have supposed, no intelligent man could hesitate, except as to the form of subordination: nor has entire equality been ever allowed in society where the inferior race constituted an element of any magnitude.

Personal servitude is generally the harshest and most objectionable form of restraint, exposing its subjects to an abuse of power involving greater suffering than any other. But this is not an invariable law, even in a homogeneous society. The most recent researches into the condition of the labouring classes of Europe, the descendants of the emancipated serfs, have satisfied all candid inquirers after truth that a large number have sunk below the level of their ancient slavery, and would be thankful to belong to any master who would furnish them with food, clothing and shelter. But when we are settling the law of a society embracing in its bosom distinct and unequal races, the problem is complicated by elements which create the gravest doubt whether personal liberty will prove a blessing or a curse. It may become a question between the slavery, and the extinction or further deterioration of the inferior race. Thus, if it is difficult to procure the means of subsistence from density of population or other cause, and if the inferior race is incapable of sustaining a competition with the superior in the industrial pursuits of life, a condition of freedom which would involve such competition, must either terminate in its destruction, or consign it to hopeless degradation. If, under these circumstances, a system of personal servitude gave reasonable assurance of preserving the inferior race, and gradually imparting to it the amelioration of a higher civilization, no Christian statesman could mistake the path of duty. Natural law, illuminated in its decision by History, Philosophy, and Religion, would not only clothe the relation with the sanction of justice, but lend to it the lustre of mercy. It will not, I apprehend, be difficult to show that all these conditions apply to African slavery in the United States. Look at the races which have been brought face to face in unmanageable masses, upon this continent, and it is impossible to mistake their relative position. The one still filling that humble and subordinate place, which as the pictured monuments of Egypt attest, it has occupied since the dawn of history; a race which during the long-revolving cycles of intervening time has founded no empire, built no towered city, invented no art, discovered no truth, bequeathed no everlasting possession to the future, through law-giver, hero, bard, or benefactor of mankind: a race which, though lifted immeasurably above its native barbarism by the refining influence of Christian servitude has yet given no signs of living and self-sustaining culture. The other, a great composite race which has incorporated into its bosom all the vital elements of human progress; which, crowned with the traditions of history and bearing in its hands the most precious trophies of civilization, still rejoices in the overflowing energy, the abounding strength, the unconquerable will which have made it "the heir of all the ages;" and which with aspirations unsatisfied by centuries of toil and achievement, still vexes sea and land with its busy industry, binds coy nature faster in its chains, embellishes life more prodigally with its arts, kindles a wider inspiration from the fountain lights of freedom, follows knowledge,

> "like a sinking star,
> Beyond the utmost bound of human thought,"

and pushing its unresting columns still further into the regions of eldest Night, in lands more remote than any over which Roman eagles ever flew, "to the farthest verge of the green earth," plants the conquering banner of the Cross,

> "Encircling continents and oceans vast,
> In one humanity."

It is impossible to believe that the supremacy in which the Caucasian has towered over the African through all the past can be shaken, or that the black man can ever successfully dispute the prëeminence with his white brother as members of the same community, in the arts and business of life. Could such races be mated with each other? It is unnecessary to refer to Egypt or Central America, where a mongrel population, *monumenta veneris nefandæ*, exhibit the deteriorating influence of a similar fusion. If there were no broad and indelible dividing lines of colour and physical organization to keep the black and white races apart, their respective traditions, extremes of moral and intellectual advancement, and unequal aptitudes, if not capacities for higher civilization, separate them by an impassible gulf. That feeble remnant of our kindred, who, surrounded by hordes of barbarians, yet linger among the deserted seats of West India civilization, may forget the dignity of Anglo-Saxon manhood, in the despair and poverty to which they have been reduced by British injustice; but we "sprung of earth's first blood," and "foremost in the files of time," who under Providence are masters of our destiny, will never permit the generations of American history to be bound together by links of shame. Is the deportation of the African race practicable? A more extravagant project was never seriously entertained by the human understanding. There are economical considerations alone, which would render it utterly hopeless. The removal of our black population would create a gap in the industry of the world, which no white imigration could fill. It would bring over the general prosperity of the country a blight and ruin, that would dry up all the sources of revenue on which the success of the measure would depend. Its consequences would not terminate with this continent. The great wheel which moves the commerce and manufactures of the world, would be arrested in its revolutions. General bankruptcy would follow a shock, besides which the accumulated financial crises of centuries would be unfelt. In the recklessness and despair of crime and famine thus induced, the ancient landmarks of empire might be disturbed, and all existing governments shaken to their foundation. No favorable inference can be drawn from immense emigration, which, like the swell of a mighty sea, is pouring upon our shores. It comes from regions where population is too dense for subsistence and where a vacant space is closed as soon as it is opened. It is impelled by double influences, neither of which can operate to any extent upon the American slave, want and wretchedness at home, and all material and moral attractions abroad. It is composed of men accustomed at least to personal freedom, and belonging to races endowed with far more energy and intelligence than the African. It is received into a community, whose strength and vitality enable it to absorb and assimilate a much larger foreign element than any of which history has any record. If the black man was able and willing to return to his native land, he must carry with him the habits and feelings of the slave. Can it be supposed that such a living cloud as the annual increase of our slaves, could discharge its contents into the bosom of any African society, without blighting in the license of their first emancipation from all restraint, whatever promise of civilization it might have held out.

If we must accept the permanent residence of this race upon our soil, as a providential arrangement beyond human control, it only remains to adjust the form of its subordination. Should it embrace personal, as well as political servitude? Personal slavery surrounds the black man with a protection and salutary control which his own reason and energies are incapable of supplying, and by converting elements of destruction into sources of progress, promotes his physical comfort, his intellectual culture, and his moral amelioration. Emancipation upon the other hand in any form, gradual or immediate, would either destroy the race through a wasting process of poverty, vice, and crime, or sink it into an irrecoverable deep of savage degradation. What Homer has said may be true, that a free man loses half his value the day he becomes a slave; but it is quite as true, that the slave who is converted into a freeman, is more likely to lose the remaining half than to recover what is gone. There are no rational grounds upon which we could anticipate for our slaves, an advancing civilization if they were emancipated, or upon which we could expect them to preserve their contented temper, their material comfort, their industrious habits, and their general morality. The negro has learned much in contact with the white man, but he is yet ignorant of that great art which is the guardian of all acquisition, the art of self-goverment. The superiority of the white man in skill, energy, foresight, providence, aptitude for improvement, and control over the lower appetites and passions, would give him a decisive and fatal advantage in the pitiless competition of life. The light which history sheds around this problem, is broad and unchanging. Wherever unequal races are brought together, unless reduced by despotism to an indiscriminate servitude, or mingled by a deteriorating and demoralizing fusion, the inferior must choose between slavery and extinction. Upon these principles only can we explain the preservation of the Indian inhabitants of Spanish America, and the destruction of the aboriginal races which have crossed the path of English colonization. All the lower stages of civilization are characterized by an improvidence of the future and a predominance of the animal nature, which increase the force of temptation, and at the same time diminish the power of resistance. Hence it is, that when an inferior race, animated by the passions of the savage, but destitute of the restraining self-control which is developed by civilization, is brought in contact with a higher form of social existence, where the stimulants and facilities for sensual gratification are multiplied, and the consequences of excess and improvidence aggravated in fatality, it is mown down by a mortality more terrific than the widest waste of war. Private charity and the influence of Christianity upon individuals may retard the operation of these causes, but destruction is only a question of time. Without a judicious husbandry of the surplus proceeds of labour in the day of prosperity to meet the demands of age, sickness and casualty, poverty alone with the disease, suffering and crime that attend it, would wear out any labouring population. The remnant of the Indian tribes scattered along the lower banks of the St. Lawrence, present an impressive illustration of these simple political truths. "They manifest," says Prof. Bowen, "sufficient industry when the reward of labour is immediate: but surrounded by an abundance of fertile and cleared land, where others would grow rich, they are rapidly perishing from improvidence alone."

Even in England, in periods of manufacturing prosperity, when wages are high, the Chancellor of the Exchequer reckons with as much confidence upon the expenditure by the operatives of their surplus profits, in spirits, tobacco, and other hurtful stimulants, as upon the proceeds of the income tax.—And if the working class of England, instead of being constantly recruited from a higher order of society, consisted of an inferior race, the annual losses from intemperance and improvidence would soon carry it off. As population becomes denser, our free blacks are destined to exemplify the same great law. In the free States, where an encroaching tide of white emigration is driving them from one field of industry after another, they already stand, as the statistics of population, disease and crime disclose, upon the narrowest isthmus which can divide life from death. When we remember that the destructive agencies which would be let loose amongst our slaves, by emancipation, are as fatal to morals as to life, and that the natural inequality between the races would be increased by a constant accession of numbers to the white through emigration, it is not extravagant to assert that exterminating massacre would involve a swifter, but scarcely more certain or more cruel death.

If emancipation took place in a tropical region, where climate forbade the competition of white labour, and the exuberance of nature supplied the means of life without the necessity of intelligent and systematic industry, there are other causes which would remove from the slave every safeguard of progress, and render his relapse into barbarism inevitable. Civilization depends upon activity, development, progress. It is measured by our wants and our work. Without indulging in any rash generalizations, we may safely affirm, that where animal life can be sustained without labour, and an enervating climate invites to indolent repose, we cannot expect from that class of society upon whom in every country the cultivation of the soil depends, any industrious emulation. So powerful is the influence of these physical causes over barbarous tribes, that under the torrid zone, as we are informed by Humboldt, where a beneficent hand has profusely scattered the seeds of abundance, indolent and improvident man experiences periodically a want of subsistence which is unfelt in the sterile regions of the North. As men increase in virtue and intelligence, they become more capable of resisting the operation of climate and other natural laws, but some form of slavery has been the only basis upon which civilization has yet rested in any tropical country. If it can be sustained upon any other, it must be by a race endowed with a larger fund of native energy than the African, or quickened by the electric power of a higher culture than he has ever possessed. His moral and physical conformation predispose him to indolence. *Cœlum non animum mutant*, has been the law of his history. Under the *Code Rural* of Hayti, the harshest compulsion has been used to subdue the sloth of barbarism, and to compel the labour of the free black man, but in vain. In the British West Indies, since emancipation, no expedients have proven effectual to conquer this repugnance to exertion. The English historian, Alison, who, whatever may be his political sentiments, has no sympathies with slavery, in his last volume, thus describes the result of the experiment. "But disastrous as the results of the change have been to British interests both at home and in the West Indies, they are as nothing to those which have ensued to the negroes themselves, both in their native seats and the Trans-Atlantic Colonies. The fatal gift of premature emancipation has proved as pernicious to a race as it always does to an individual: the boy of seventeen sent out into the world, has continued a boy, and does as other boys do. The diminution of the agricultural exported produce of the islands to less than a half, proves how much their industry has declined. The reduction of the consumption of their British produce and manufactures in a similar proportion, tells unequivocally how much their means of comfort and enjoyment have fallen off. Generally speaking, the incipient civilization of the negro has been arrested by his emancipation: with the cessation of forced labour, the habits which spring from and compensate it, have disappeared, and savage habits and pleasures have resumed their ascendency over the sable race. The attempts to instruct and civilize them have, for the most part, proved a failure; the *dolce far niente* equally dear to the unlettered savage as to the effeminate European, has resumed its sway; and the emancipated Africans dispersed in the woods, or in cabins erected amidst the ruined plantations, are fast relapsing into the state in which their ancestors were when first torn from their native seats by the rapacity of a Christian avarice." A melancholy confirmation of this statement is furnished by a fact which I have learned from a reliable private source, that the prevailing crimes of this population have changed from petty larceny to felonies of the highest grades. But if the black race could escape barbarism, or defy those destroying elements of society, poverty and crime, there is a more comprehensive political induction which establishes the justice and expediency of its subjection to servitude. If in any community there is an inferior race which is condemned by permanent and irresistible causes to occupy the condition of a working class, not as independent proprietors of the soil they till, but as labourers for hire, then a system of personal slavery under which the welfare of the slave could be connected with the interest of the master, would be far preferable to the collective servitude of a degraded caste. This proposition supposes the existence, not of an inferior class simply, but an inferior race—which, as such, is condemned by nature to wear the livery of servitude in some form—which can never be quickened or sustained by those animating prospects of wealth, dignity and power which, in a homogeneous community, pour a renovating stream of moral health through every vein and artery of social life—which must earn a scanty and precarious subsistence by a stern, unintermitting and unequal struggle with selfish capital. Can any skepticism resist the conviction that, under such circumstances, a social adjustment which would engage the selfish passions of the superior race to provide for the comfort of the inferior, must be an arrangement of mercy as well as of justice? Upon this question the experience of England is full of instruction. The abolition of slavery upon the continent of Europe gradually converted the original serfs into owners of the soil. In England, it terminated with personal manumission—leaving the villein to work as a labourer for wages, or to farm as a tenant upon lease. What has been the effect of this great social revolution? I do not refer to that saturnalia of poverty, misery, vagrancy, and crime which immediately followed the disruption of the old feudal bonds, and the adjustment of the new relations of lord and vassal, by the "cold justice of the laws of political economy." What is the present condition of the English labourer? English writers, whose fidelity and accuracy are above suspicion, have almost exhausted the power of language in describing his abject wretchedness and squalid misery. They have distributed their population into the rich, the comfortable, the poor, and the perishing. That "bold peasantry, their country's pride," has almost disappeared. Every improvement in an industrial process which diminishes the amount of human labour, brings with it more or less of suffering to the English operative. Every scarce harvest, every fluctuation in trade, every financial crisis exposes him to beggary or starvation. In the selfish competition between the capitalist and workman, says a distinguished christian philanthropist, "the capitalist, whether farmer, merchant, or manufacturer, plays the game, wins all the high stakes, takes the lion's share of the profits, and throws all the losses, involving pauperism and despair, upon the masses." Nothing can be more hopeless than the condition of the agricultural labourer. All the life of England, says Bowen in his lectures on Political Economy, "is in her commercial and manufacturing classes. Outside of the city walls, we are in the middle ages again. There are the nobles and the serfs, true castes, for nothing short of a miracle can elevate or depress one who is born a member of either." Moral and intellectual culture cannot be connected with physical destitution and suffering. We are not therefore surprised to learn, from a recent British Quarterly, that there is an overwhelming class of outcasts at the bottom of their society whom the present system of popular education does not reach, who are below the influence of religious ordinances, and scarcely operated upon by any wholesome restraint of public opinion. For the relief of this wretchedness an immense pauper system has grown up, as grinding in its exactions upon the rich, as demoralizing in its bounties to the poor. But even this frightful evil appears insignificant, in comparison with that embittered and widening feud between the classes of society, which has filled the most sanguine friends of human progress with the apprehension, that England's greatest danger may spring from the despair of her own children, the beggars who gaze in idleness and misery at her wealth, the savages who stand by the side of her civilization, and the heathen who have been nursed in the bosom of her Christianity. The intelligent philanthropists of England, place their whole hope of remedy in plans of colonization—plans for substituting cöoperative associations for the system of hired service—plans for increasing the number of peasant proprietors, and thus placing labour on a more independent basis—for educating the working class, and for legislation which will facilitate the circulation of capital, and the more equal distribution of property. But if this evil working in the heart in the nation be incurable, if the helotism of the working classes should prove, as it has already been pronounced, irretrievable, I am far from advocating a reduction of the English labourer to slavery. There is no radical distinction of race, between the labourer and the capitalist. The latter owes his superiority, not to nature, but to the vantage ground of opportunity. Nature has implanted a consciousness of equality, so deeply in the bosom of the labourer, that personal slavery would bring with it a sense of degradation he could never endure. Whatever the general destitution and sufferings of his class, an undying hope will ever whisper to the individual that a happy fortune may raise him to comfortable independence, or social consideration. The very thought, that from his loins may spring some stately figure to tread, with dignity the shining eminences of life, is able to alleviate many hours of despondency. But above all, an instinctive love of liberty, such as was felt by the Spartan when he compared it to the sun, the most brilliant, and at the same time, the most useful object in creation, cherished in the Englishman by the traditions of centuries of struggle in its achievement and defence, cause him to echo the sentiment of his own poet,

> "Bondage is winter, darkness, death, despair,
> Freedom, the sun, the sea, the mountains and the air."

I fully subscribe to an opinion which has been expressed by an accomplished Southern writer, that an attempt to enslave the English labourer would equal, though it could not exceed in folly, an attempt to liberate the American slave—either seriously attempted and with sufficient power to oppose the natural current of events would overwhelm the civilization of the continent in which it occurred in anarchy. But if the English labourer belonged to a different race from his employer; if they were separated by a moral and intellectual disparity such as divides the Southern slave from his master: if instead of the sentiments and traditions of liberty which would make bondage worse than death, he had the gentle, tractable and submissive temper that adapt the African to servitude, who can doubt that a slavery which would insure comfort and kindness, would improve his condition in all its aspects?

None of the circumstances which prevent the application of the general proposition we have been discussing to the English labourer, extend to the American slave—none of the plans which have been suggested for the relief of the former would offer any hope of amelioration to the latter. No man who knows anything of the negro character, can for a moment suppose that the land of the country, could be distributed between them as tenant proprietors. If it was given to them to day, their improvidence would make it the property of the white man to morrow. Indeed the fact to which Mr. Webster called attention, that the products of the slave-holding States are destined mainly, not for the immediate consumption, but for purposes of manufacture and commercial exchange, exclude the possibility of an extended system of tenant proprietorship, and render cultivation and disposal by capital upon a large scale indispensable. The black man if emancipated must work for hire. Would he be better able to hold his own against the capitalist than the English labourer? Would not the misery and degradation of the latter, but faintly foreshadow the doom of the emancipated slave? His days embittered and shortened by privation; cheered by no hope of a brighter future; the burthens of liberty without its privileges; the degradation of bondage without its compensations; "the name of freedom graven on a heavier chain;" his root in the grave, the liberated negro under the influence of moral causes as irresistible as the laws of gravity, would moulder earthward. What is there, may I not ask, in the misery and desolation of this collective servitude, to compensate for the sympathy, kindness, comfort, and protection which so generally solace the suffering, and sweeten the toil, and make tranquil the slumber, and contented the spirits of the slave, whose lot has been cast in the sheltering bosom of a Southern home?

The approximation to equality in numbers, which has been hastily supposed to render emancipation safer than in the West Indies, would give rise to our greatest danger. It will not be long before the unmixed white population of the West Indies will be reduced, by the combined influences of emigration and amalgamation, to a few factors in the sea ports. In the United States, not only would the exodus of either race, or their fusion, be impracticable, but the pride of civilization, which now stoops with alacrity to bind up the wounds of the slave, would spurn the aspiring contact of the free man. The points of sympathy between master and slave may not be as numerous or powerful as we could desire, but between the white and the black man, in any society in which they are recognised as equals, and in which the latter are sufficiently numerous to create apprehension as to the consequences of distrust and aversion, a growing ill-will would deepen into irreconcilable animosity. Look at the isolation in which, notwithstanding their insignificance as a class, the free blacks of the North now live. "The negro," says De Tocqueville, "is free, but he can share neither the rights, nor the pleasures, nor the labour, nor the affections, nor the altar, nor the tomb of him whose equal he has been declared to be. He meets the white man upon fair terms, neither in life nor in death." What could be expected from a down-trodden race, existing in masses large enough to be formidable, in whose bosoms the law itself nourished a sense of injustice by proclaiming an equality which Nature and society alike denied, with passions unrestrained by any stake in the public peace, or any bonds of attachment to the superior class, but that it should seek in some frenzy of despair, to shake off its doom of misery and degradation? Would not the atrocities which have always distinguished a war of races, be perpetrated on a grander and more appalling scale than the world has ever yet witnessed? The recollections of hereditary feud alone have, in every age, so inflamed the angry passions of our nature as to lend a deeper gloom even to the horrors of war. When the poet describes the master of the lyre, as seeking to rouse the martial ardour of the Grecian conqueror and his attendant nobles, he brings before them the ghosts of their Grecian ancestors that were left unburied on the plains of Troy, who tossing their lighted torches—

"Point to the Persian abodes,
And glittering temples of their hostile gods."

But what would be the ferocity awakened in half-savage bosoms, when embittered memories of long-descended hate towards a superior race, exasperated by the maddening pangs of want, impelled them to seek retribution for centuries of imaginary wrong? Either that precious harvest of civilization which has been slowly ripening under the toils of successive generations of our fathers, and the genial sunshine and refreshing showers of centuries of kindly Providence, would be gathered by the rude sons of spoil, or peace would return after a tragedy of crime and sorrow, with whose burthen of woe the voice of history would be tremulous through long ages of after time.

The whole reasoning of modern philanthropy upon this subject has been vitiated, by its overlooking those fundamental moral differences between the races, which constitute a far more important element in the political arrangements of society, than relative intellectual power. It is immaterial how these differences have been created. Their existence is certain; and if capable of removal at all, they are yet likely to endure for such an indefinite period, that in the consideration of any practical problem, we must regard them as permanent. The collective superiority of a race can no more exempt it from the obligations of justice and mercy, than the personal superiority of an individual; but where unequal races are compelled to live together, a sober and intelligent estimate of their several aptitudes and capacities must form the basis of their social and political organization. The intellectual weakness of the black man is not so characteristic, as the moral qualities which distinguish him from his white brother. The warmest friends of emancipation, amongst others the late Dr. Channing, have acknowledged that the civilization of the African, must present a different type from that of the Caucasian, and resemble more the development of the East than the West. His nature is made up of the gentler elements. Docile, affectionate, light-hearted, facile to impression, reverential, he is disposed to look without for strength and direction. In the courage that rises with danger, in the energy that would prove a consuming fire to its possessor, if it found no object upon which to spend its strength, in the proud aspiring temper which would render slavery intolerable, he is far inferior to other races. Hence, subordination is as congenial to his moral, as a warm latitude is to his physical nature. Freedom is not "chartered on his manly brow" as on that of the native Indian. Unkindness awakens resentment, but servitude alone carries no sense of degradation fatal to self-respect. A civilization like our own could be developed only by a free people; but under a system of slavery to a superior race, which was ameliorated by the charities of our religion, the African is capable of making indefinite progress. He is not animated by that love of liberty which Bacon quaintly compared to a spark that ever flieth in the face of him who seeketh to trample it under foot. The masses of the old world, under various forms of slavery, have exhibited a standing discontent, and their struggles for freedom have been the flashes of a smothered but deeply hidden fire. The obedience of the African, unless disturbed by some impulse from without, and to which he yields only in a vague hope of obtaining respite from labour, is willing and cheerful. De Tocqueville, in his work on the French Revolution, points out a difference between nations, in what he calls the sublime taste for freedom—some seeking it for its material blessings only, others for its intrinsic attractions; and adds, "that he who seeks freedom for anything else than freedom's self, is made to be a slave." How fallacious must be any political induction which transfers to the African that love of personal liberty, which wells from the heart of our own race in a spring-tide of passionate devotion, the winters of despotism could never chill. The Providence which appointed the Anglo-Saxon to lead the van of human progress fitted him for his mission, by preconfiguring his soul to the influences of freedom. This sentiment is indestructible in his nature. It would survive the degradation of any form or term of bondage. Like the sea shell, when torn from its home in the deep, his heart, through all the ages of slavery, would be vocal with the music of his native liberty.

The strength of that security against oppression which the Southern slave derives from the selfishness of human nature, has never been sufficiently appreciated, for, in truth, it has existed in connection with no other form of servitude. With exceptions too slight to deserve remark, in Greece and Rome, in the British and Spanish colonies, it was cheaper to buy slaves than to raise them, to work them to death, than to provide for them in life. Hence in Rome, the slaves of the public were better cared for than those of the individual. With us, the master has a large and immediate interest, not only in the life, but the health, comfort and improvement of his slave, for they all add to his value and efficiency as a labourer. Southern slavery must therefore be tried upon its own merits, and not by data true or false, collected from other forms of servitude. Arithmetic, Gibbon once said, is the natural enemy of rhetoric, and a single statement will suffice to discredit all the reasoning, and pour contempt upon all the declamation which has confounded our slavery with that of the British West Indies. From the most reliable calculations that can be made, says Carey, in his Essay on the Slave Trade, it appears that for every African imported into the United States, ten are now to be found, such has been the wonderful growth of population; for every three imported into the British West Indies, only one now exists, such has been its frightful decline. But however ample this protection may be to the slave from the oppression of strangers, his own passions, it is urged, will lead the master to spurn the restraints of interest. But what security against an abuse of power, has human wisdom ever devised which is likely to operate with such uniform and prevailing force? As Burke said of another social institution, "it makes our weakness subservient to our virtue, and grafts our benevolence, even upon our avarice." All the evidence which is accessible, the statistics of population, of consumption as shown both by imports, and the balance between production and exports, and the testimony of intelligent and candid travellers bear witness to its general efficiency. And it is to be remarked that whilst the slave partakes largely and immediately of his master's prosperity, the reverses which reduce the latter to beggary or starvation, pass almost harmless over his head. In other countries the pressure of every public calamity falls upon the working classes: but with us the slave is placed in a great measure beyond their reach, by the circumstance that his hire or ownership import a condition of life in which the means of subsistence are enjoyed. From the demoralization of extreme want, so fatal to virtue as well as happiness in other lands, he is thus always saved. It was the benevolent wish of Henry the Fourth, of France, that every peasant in his dominions might have a fowl in his pot for Sunday. In every age the patriot has offered a similar prayer for the labouring poor of his country. But it is only in the Southern States of our confederacy, that the sun ever beheld a meal of wholesome and abundant food, the daily reward of the children of toil.

The relation is so far from having any tendency to provoke those angry and resentful feelings which would excite the master to acts of cruelty, that its tendency is directly the reverse.

It was truly said by Legaré, that *parcere subjectis*, was not exclusively a Roman virtue: that it was a law of the heart, the usual attribute of undisputed power; and that there were few men who did not feel the force of that beautiful and touching appeal: "Behold, behold, I am thy servant." It was owing to this principle that when the dependence of the feudal vassal upon his lord was most complete, their mutual attachment, (as we are assured by Gilbert Stewart and other historians of this period,) was strongest, and as the feudal tenure decayed, and the law was interposed between them, the kindness upon one side and the affection and gratitude upon the other disappeared. It is not simply the consciousness of strength which tends to disarm resentment in the bosom of the master. It is the long and intimate association, connected with the feelings of interest awakened in all but the hardest hearts by the cares and responsibilities of guardianship which makes the slave an object of friendly regard, and bring him within that circle of kindly sympathies which cluster around the domestic hearth. It is a form of that generous feeling which bound the Highland chieftain to his clan, and which, with greater or less force, depending upon the virtue of the age, attaches to every relation of patriarchal authority. According to Dr. Arnold, (in his tract on the Social Condition of the Operative Classes,) the old system of English slavery was far kinder than that now existing in England of hired service. The affection between the master and the villain is shown by the fact that villainage "wore out" by voluntary manumission—a circumstance which never would have happened had the relation been one simply of profit and loss. Shakspeare in his character of old Adam, in "As You Like It," has adverted to the more genial and kindly elements which distinguished this legal service from that for wages. Orlando, in replying to the pressing entreaty of the old servant to go with him, and "do the service of a younger man in all his business and necessities," says—

"Oh good old man, how well in thee appears
The constant service of the antique world,
When service sweat for duty—not for meed."

The mutual good will of distinct classes has, in all ages, been dependent upon a well defined subordination. This opinion is confirmed by the testimony of one of the most eloquent writers of New England, in reference to the workings of its social system as they fell under his personal observation. "I appeal," says Dana in his Essay on Law as suited to Man, "to those who remember the state of our domestic relations, when the old Scriptural terms of master and servant were in use. I do not fear contradiction when I say there was more of mutual good will then than now; more of trust on the one side and fidelity on the other; more of protection and kind care, and more of gratitude and affectionate respect in return; and because each understood well his place, actually more of a certain freedom, tempered by gentleness and by deference. From the very fact that the distinction of classes was more marked, the bond between the individuals constituting these two, was closer. As a general truth, I verily believe that, with the exception of near-blood relations, and here and there peculiar friendships, the attachment of master and servant was closer and more enduring than that of almost any other connection in life. The young of this day, under a change of fortune, will hardly live to see the eye of an old, faithful servant fill at their fall; nor will the old domestic be longer housed and warmed by the fireside of his master's child, or be followed by him to the grave. The blessed sun of those good old days has gone down, it may be for ever, and it is very cold." It is through the operation of these kindly sentiments, which it awakens on both sides, that African slavery reconciles the antagonism of classes that has elsewhere reduced the highest statesmanship to the verge of despair, and becomes the great Peace-maker of our society, converting inequalities, which are sources of danger and discord in other lands, into pledges of reciprocal service, and bonds of mutual and intimate friendship.

But a vigilant and restraining public opinion surrounds our slaves with a cumulative security. The master is no chartered libertine. Custom, the greatest of lawgivers, places visible metes and bounds upon his authority which few are so hardy as to transcend. Native humanity and Christian principle inscribe their limitations upon the living tables of his heart. A public sentiment, growing in its strength and increasing in its exactions, covers the slave with a protecting shield, far less easily or frequently broken through, than those feeble barriers of law which in our Free States, are interposed between the degraded and outcast black man, and his white brother. Written laws never to be received as accurate exponents of the rights and privileges of a people, are most fallacious when appealed to as a standard, by which to determine the character of a system of slavery; for the wisest and most humane must acknowledge that the introduction of law may so disturb the harmony and good will of any domestic relation, as to breed more mischief than it can possibly cure. It is not simply in reference to the food, clothing, work, holydays, punishments of slaves, that public sentiment exercises its supervision and restraint. It looks to the whole range of their happiness and improvement. It is operating with great force in inducing masters to provide more extended facilities for their religious instruction. It has to a large extent terminated that disruption of family ties, which has always constituted the most serious obstacle to the improvement of the slave, and the severest hardship of his lot. A Scotch weaver, William Thompson, who travelled through our Southern States in 1843, on foot, sustaining himself by manual labour, and mixing constantly with our slave population, states in a book which he published on his return home, that the separation of families did not take place here to such an extent as amongst the labouring poor of Scotland. We know that the evil has been diminishing with every succeeding day, and I trust that public sentiment will not leave this most beneficent work half done. The sanctity and integrity of the family union is the germ of all civilization. There is nothing in slavery to make its violation inevitable. It may require some time and sacrifice to accommodate the habits of society to the universal prevalence of a permanent tenure in these relations. But through the agency of public sentiment alone, acting upon buyer and seller, and operating where necessary through combinations of benevolent neighbours, the mischief in its entire dimensions lies within the grasp of remedy.

Slavery is charged with fixing a point in the scale of civilization, beyond which it does not permit the labourer to rise. God, it is argued, has conferred the capacity and imposed the duty of improvement, but man forever denies the opportunity. I admit that the refining, elevating, and liberalizing influences of knowledge can not be imparted to the slave, in an equal degree with his master. But this arises from the fact that he is a labourer, not that he is a slave. It proceeds from a combination of circumstances which human laws could not alter, and which render daily toil the unavoidable portion of the black man. Civilization is a complex result, demanding a multitude of special offices and functions, for whose performance men are fitted, and even reconciled by gradations in intelligence and culture. However exalting or ennobling might be the knowledge of Newton or Herschell, God in his providence has denied to the larger part of the human family, the opportunity of obtaining it. The apparent hardship of this arrangement disappears when we reflect that this life is only a school of discipline and probation for another, and that a variety of condition involving distinct spheres of duty, may be the wisest and most merciful provision for each. Every age rises to a higher level of general intelligence, but the mass of men must be satisfied with that prime wisdom, "to know that before us lies in daily life." Whilst I doubt not that,

> "Through the ages one increasing purpose runs,
> And the thoughts of men are widened with the circuit of the suns,"

yet so long as the Divine ordinance, the poor ye have always with you, remains unrepealed—an ordinance without which the fruits of industry would be consumed, and its accumulations cease, the classes of society must be divided by a broad line of disparity in intellectual culture. Emancipation would not relieve the slave from the necessities of daily labour, or furnish the leisure for extending mental cultivation. There might be individual exceptions; but all legislation must take its rule from the general course of human nature, not its accidental departures and variations. It is emancipation and not servitude, which would forever darken and extinguish those prospects of amelioration that now lie imaged in the bright perspective of Christian hope. The slave will partake more and more of the life-giving civilization of the master. As it is, his intimate relations with the superior race, and the unsystematic instruction he receives in the family, have placed him in point of general intelligence above a large portion of the white labourers of Europe. It appears from the most recent statistics, that one half the adult population of England and Wales are unable to write their names. It was of English labourers, not American slaves, that Gray wrote those touching lines—

"But knowledge to their eyes her ample page,
Rich with the spoils of time, did ne'er unroll;
Chill penury repressed their noble rage.
And froze the genial current of the soul."

But it is supposed that our slaves can never be instructed without danger to the public safety, as knowledge, like the admission of light into a subterranean mine, might lead to an explosion. There may be circumstances in which the supreme law of self-preservation will command us to withhold from the slave the degree of information we would gladly impart. But it is never to be forgotten, that this stern and inexorable necessity will not be created by the system itself. The sin, and the responsibility of its existence will lie at the door of the misjudging philanthropy which has rashly and ignorantly interposed to adjust relations on whose balance hang great issues of liberty and civilization. If the views which have been presented are true, the more his reason was instructed, the clearer would be the slave's perception of the general equity of the arrangement which fixed his lot. But if knowledge is to introduce him to literature which will confuse his understanding by its sophistry, whilst it inflames his passions by its appeals, which will exaggerate his rights and magnify his wrongs, then mercy to the slave, as well as justice to society, require us to protect him from the folly and crime into which he might be hurried by the madness of moral intoxication. We will not throw open our gates, that the enemies of peace may sow the dragon's teeth of discord, and leave us to reap a harvest of confusion and rebellion—but when they come to plant love amongst us, to teach apostolic precepts, as elementary morality, and to hold up the standard of Holy Scripture as the rule of conduct, and proof of law, we will give them hospitable welcome.

If I have at all comprehended the elements which should enter into the determination of the momentous problem of social welfare and public authority, the existence of African Slavery amongst us, furnishes no just occasion for self-reproach; much less for the presumptuous rebuke of our fellow man. As individuals, we have cause to humble ourselves before God, for the imperfect discharge of our duties in this, and in every other relation of life: but for its justice and morality as an element of our social polity, we may confidently appeal to those future ages, which, when the bedimming mists of passion and prejudice have vanished, will examine it in the pure light of truth, and pronounce the final sentence of impartial History. Beyond our borders, there has been no sober and intelligent estimate of its distinctive features; no just apprehension of the nature. extent and permanence of the disparities between the races, or of the fatal consequences to the slave, of a freedom which would expose him to the unchecked selfishness of a superior civilization; no conception approaching to the reality of the power which has been exerted by a public sentiment, springing from Christian principle, and sustained by the universal instincts of self-interest, in tempering the severity of its restraints, and impressing upon it the mild character of a patriarchal relation; no rational anticipation of the improvement of which the negro would be capable under our form of servitude, if those who now nurse the wild and mischievous dream of peaceful emancipation, should lend all their energies to the maintenance of the only social system under which his progressive amelioration appears possible. African slavery is no relic of barbarism to which we cling from the ascendency of semi-civilized tastes, habits, and principles; but an adjustment of the social and political relations of the races, consistent with the purest justice, commended by the highest expediency, and sanctioned by a comprehensive and enlightened humanity. It has no doubt been sometimes abused by the base and wicked passions of our fallen nature to purposes of cruelty and wrong; but where is the school of civilization from which the stern and wholesome discipline of suffering has been banished? or the human landscape not saddened by a dark-flowing stream of sorrow? Its history when fairly written, will be its ample vindication. It has weaned a race of savages from superstition and idolatry, imparted to them a general knowledge of the precepts of the true religion, implanted in their bosom sentiments of humanity and principles of virtue, developed a taste for the arts and enjoyments of civilized life, given an unknown dignity and elevation to their type of physical, moral and intellectual man, and for two centuries during which this humanizing process has taken place, made for their subsistence and comfort, a more bountiful provision, than was ever before enjoyed in any age or country of the world by a laboring class. If tried by the test which we apply to other institutions, the whole sum of its results, there is no agency of civilization which has accomplished so much in the same time, for the happiness and advancement of our race.

I am fully persuaded, Mr. President, that the preservation of our peace and union, our property and liberty depend upon the triumph of these opinions over the delusion and ignorance which have obscured and perplexed the public judgment upon this question of slavery. I believe that they indicate the only tenable line of argument along which we can defend our rights or character. So long as men regard all forms of slavery as sinful, they will be conducted to the conclusion that any aid or comfort to them, is likewise sinful, by a logical necessity, which their passions or interests can only resist for a time. The conviction that justice is the highest expediency for the statesman, the first duty of the Christian, and should be supreme law of the State, will sooner or later establish its supremacy over all combinations of parties and interests. So long as our fellow-citizens of the North look upon this relation as barbarous and corrupting, they must and ought to desire and seek its extinction, as a great vice and crime. Every year will deepen their sympathy with the slave, suffering under unjust bonds, and inflame their resentful indignation towards the master who holds his odious property with unrelaxing grasp. Mutual self-respect is the only term of association upon which either individuals or societies can or ought to live together. How long could our Union endure, if it was to be preserved by submission to a fixed policy of injustice, and acquiescence under an accumulating burthen of reproach? We are willing to give much for Union. We will give territory for it; the broad acres we have already surrendered would make an empire. We will give blood for it; we have shed it freely upon every field of our country's danger and renown. We will give love for it; the confiding, the forgiving, the overflowing love of brothers and freemen. But much as we value it, we will not purchase it at the price of liberty or character. A union of suspicion, aversion, injustice, in which we would be banned not blessed, outlawed not protected, whether by faction under the forms of law or revolution over them I care not, has no charms for me. The Union I love, is that which our fathers formed; a Union which, when it took its place upon the majestic theatre of history, consecrated by the benedictions of patriots and freemen, and covered all over with images of fame, was a fellowship of equal and fraternal States; a Union which was established not only as a bond of strength, but as a pledge of justice and a sacrament of affection; a Union which was intended, like the arch of the heavens, to embrace within the span of its beneficent influence all interests and sections and to rest oppressively or unequally upon none; a Union in which the North and the South—"like the double-celled heart, at every full stroke," beat the pulses of a common liberty and a common glory. Mr. Madison has recorded a beautiful incident, which occurring as the members of the Federal Convention were attaching their signatures to the Constitution, forms a fitting and significant close to its proceedings. Dr. Franklin pointing to the painting of a sun which hung behind the speaker's chair, and adverting to a difficulty which is said to exist in discriminating between the picture of a rising and a setting sun, remarked that during the progress of their deliberations, he had often looked at this painting and been doubtful as to its character, but that he now saw clearly that it was a rising sun. When the fancy of Franklin gave to the painting its auroral hues, she had dipped her pencil in his heart. Let but a healing conviction of the true character of our system of slavery enter into the public sentiment of the North; let it understand that the South is seeking to discharge, not simply the obligations of justice, but the larger debt of Christian humanity towards this degraded race; and that if it has not accomplished more, it is because its people, like the workmen upon Solomon's temple, have been compelled to labour on their social fabric with the trowel in one hand, and the sword in the other: and the old feelings of mutual regard would soon follow a mutual respect resting upon immovable foundations; the animosities and dissentions of the past would be buried in the duties of the Present and the Hopes of the Future; the memories of our great heroic age would breathe over us a second spring of patriotism: the comprehensive American sentiment which framed this league of love would revive in all its quickening power, in the bosoms of our people, spreading undivided over every portion of our territory, and operating unspent through all generations of our history; the Union would be so clasped in the North, and in the South, to our heart of hearts, that death itself could not tear loose the clinging tendrils of devotion; and that emblematic painting in which our fathers, with "no form nor feeling in their souls, unborrowed from their country," greeted with patriot prayer and hope, the rising beams of morning, would never by any line of lessening light, betoken to the eyes of their children a parting radiance.

I have an abiding faith in Time, Truth and Providence. Let but the educated mind of our society be fully awakened to the magnitude of its responsibilities, and thoroughly instructed in the duties of its mission: let it meet the falsifications of history, and perversions of philosophy, and corruptions of religion, in the varied forms of wise and temperate discussions; let it catch the spirit of Milton, when he was content to lose his sight in writing for the defence of the liberties of England, and inspired by yet deeper enthusiasm in a cause upon which may depend the liberties and civilization of the whole earth, now in common peril from a universal licentiousness of opinion, unseal all its fountains of wit, eloquence and logic; and there would soon set out from our Southern coast, a great moral Gulf Stream, able to penetrate and warm all currents of opposing thought—although they come in strength and volume of ocean tides.

NOTE.—This Address at the time of its delivery had not been entirely committed to writing. The author has sometimes found it impossible to recall the exact language which was then employed. He has, also, after conference with some members of the Executive Committee of the State Agricultural Society, added an occasional statement and illustration, which the limits of the oral discourse obliged him to omit.

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At the close of the Annual Address, the President called Mr. Edmunds, first Vice President, to the Chair.

Mr. Newton then moved the following resolution, which was unanimously adopted:

Resolved, That the thanks of the Virginia State Agricultural Society be tendered to Professor Holcombe for the very able, eloquent and philosophical discourse which he has just delivered, and that a copy be requested for publication in all the journals of the Commonwealth, the Agricultural papers, and in the transactions of the Society.

The Chairman of the Meeting, Mr. Edmunds, stated that the Executive Committee had duly considered the subject of the practicability of uniting the two Societies, referred to them by resolution of the meeting of the 3rd instant; and that a report was in the hands of the Secretary to be now read to the meeting, if it should be their pleasure to hear it. The resolution of the 3rd instant was then read, after which the following minute, which had been adopted by the Executive Committee on the motion of Mr. Edmunds, was submitted to this meeting as their report:

"The Executive Committee of the State Agricultural Society having had under consideration the resolution of the State Society passed in general meeting on the 3rd instant, and having conferred with the Executive Committee of the Union Agricultural Society on the grave and important subject embraced in the resolution—beg leave to report unanimously, that, in the absence of a number of the members of the Committee, and in view of the deep importance of the subject, they deem it inexpedient to report prior to the next meeting of the Farmers' Assembly, upon which body the Constitution devolves the final decision."

Mr. Cox, of Chesterfield, moved the following resolution:

Resolved, That the report just presented be referred to a Committee of five, who shall have leave to retire, consider the same, and report immediately to this body, recommending such action as they may deem it proper and expedient for this meeting to adopt.

Mr. Branch proposed as a substitute the following resolution, which was accepted by the mover, and adopted by the meeting:

Resolved, That the report of the Executive Committee be recommitted, with instructions to hold further conference with the Executive Committee of the Union Agricultural Society during the time intervening, and that they report to the next meeting of the Farmers' Assembly on the practicability of a permanent union of the two

Societies, and also the terms of such union, if found practicable.

The meeting then adjourned.

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FRIDAY EVENING, Nov. 5th, 1858.

The members of the Union Society of Virginia and North Carolina, and of the Virginia State Agricultural Society, convened in joint meeting at the Market Street Baptist Church to hear the Valedictory Address. Ex-President Tyler was escorted to the stand by a Committee of the two Societies, and was greeted with enthusiastic demonstrations of respect, due to the venerable statesman, who, after life-long devotion of himself to the service of his country, has so gracefully exchanged the sword of authority for the ploughshare and the pruning-hook, and surrendered the robes and the tenure of office for the simple vesture and the dignified retirement of the citizen Farmer. He then proceeded to deliver the following Valedictory:

Mr. President and Gentlemen:

My task is readily accomplished. I am here to congratulate you on the continued success of the Society which bears the name of our time-honoured Commonwealth, and of that with which it has upon this occasion united its destinies. That success is strikingly illustrated by the evidences presented on those grounds. The earth, although parched and dried up by a drought of unusual duration, has nevertheless contributed its cereals, and fruits, and flowers, to embellish the scene of your Fair Grounds, while your mines, now in a course of rapid and successful development, have given up specimens of their hidden treasures, in proof of vast resources yet to be dug from the bosom of distant mountains. The manufacturer on his part has been no listless spectator of the passing scene. The results of the loom and the spindle—of the ingenious contrivances to mitigate the severity of labour—of improvements in the mechanic arts—of the numberless machines, apparently instinct with life, so admirably and systematically do they perform their functions—all bespeak that hand and mind are alike at work, and that our fellow-citizens are every where actively engaged in aiding the good part of raising food for the hungry, and clothes for the naked, and in ameliorating the condition of society in all its departments. Here, too, have been exhibited the products of your pastures and fields—in horses matchless for blood and strength—in cattle of the finest form and structure—of sheep admirable for flesh and fleece, and of other animals which contribute so essentially to the comforts and necessities of life; and here, too, the Dairy and Poultry-yard have liberally contributed their stores in order to enrich the scenes. May I not, then, congratulate you on this sixth times repeated success of your patriotic associations. The opinion has extensively prevailed in other States that Virginia had seen her best days; that her soil, by a long and severe course of tillage, was exhausted, and that her people led a torpid existence, content to pass their lives in dreams of other days, and in the boast of an illustrious ancestry, and in anticipation of a future that can never come to an idle and effeminate race. Bid these mistaken revilers visit the Fair Grounds of the numerous Agricultural Societies throughout the State. If this does not answer to dispel the delusion, take them to your several estates throughout the broad surface of the country; point out to them the march of improvement within the period of twenty years; shew them your fields during the season of harvest home, teeming with the golden abundance; tell them that those fields now producing from twenty to forty fold, were indeed then worn and nearly exhausted by a culture of 250 years; say to them what was truly the case, that our people had to abandon the lands on which they were born, to flee to others embosomed in the distant wilderness, where ploughman's whistle had never been heard, or woodman's axe had never resounded since the days of the great flood. That in deserting their old paternal homesteads, where they had passed the days of their infancy and early manhood, they might well break out in the language of Melibeus to Tityrus when forced to leave Italy—

"Nos patriæ fines, et dulcia linquimus arva;
Nos patriam fugimus:"

But that now the broom-straw old fields had disappeared—migration had nearly ceased, and that the old homesteads were ample and broad enough to shelter one and all, and the lands restored to more than their primeval fertility. If not yet satisfied, transport them to regions but recently visited by the steam-engine, and open to their view extensive and fertile districts which, until now, have been alien to the world, and almost buried in primeval forests. Tell them that the hum of industry already disturbs the silence which there has ruled supreme, and that in a few years more the voice of activity and life will awaken the one universal echo through mountain and vale. And if still unconvinced, carry the unbelievers into your workshops and your mines. Point out to them the increase of the mechanical arts, and exhibit to them the extent of your mineral treasures—carry them, if no farther, to the banks of the Holstein, and call their attention to a comparatively small area of valley and mountain, whose treasures of salt and plaster exceed in value the estimated value of the great and overshadowing city of New York. If, with these evidences of increasing prosperity, they alter into the nasal twang, which I have often heard, of a decline of intellect among us, lead them into an assembly of our farmers, and after having heard their debates, then may we exclaim in an exultant voice, these are our people, and here are the men whose fathers were in the olden time the leaders of the hosts to the land of promise, and are themselves worthy to be their successors—and to finish the picture, then point them to your wives and mothers, leading by their hands their infant children, to swear upon the altar of the living God eternal enmity, not as Hannibal, the Carthagenian, against an earthly power, but against immorality and vice in all its forms. Such is Virginia now, and such the symbol of a still greater Virginia that is to be. These make her what she is, the great conservative State of the Union, and impart to her a moral influence more important than is tobe found in numbers, or in an army with banners.

Need I do more than point you to the motto of that glorious flag which floated over our fathers in other days, and has waved over you on this occasion. Let the motto of each and all be *Perseverando*. And where can that old flag more proudly float than over that city which, by its heroism and its perseverance, has sought every field on which honor was to be won, and has gloriously acquired the title of the Cockade city of Virginia, "the blessed mother of us all." I remember well the day when the cry came from the far northwest for aid and succour. Discomfiture had befallen our arms, and a combined force pressed upon our exposed frontiers. Then there stepped forth from the ranks of her citizens, that noble and gallant corps which, with a step firm and determined, entered the wilderness and breasted at Fort Meigs, the wild and furious assaults of Proctor and its hosts. Nor can I quit this theme without expressing your sense, Mr. President, and that of those assembled here at the manner of your reception by the citizens of this flourishing city upon the present occasion. Petersburg has interwoven an additional wreath into her cockade, and there it floats in all the enticing loveliness of hospitality—unbounded and unlimited. Wear in your heart of hearts gentlemen, that proud old motto, "*Perseverando*. Let no petty local jealousies introduce discord into your councils. For men to differ is the inevitable result of freedom of thought and of speech—let no such differences affect the great and valuable association which you have so successfully organized. It is Virginia that pleads—you Mr. President of the State Agricultural Society, permit me to say, are more than all others interested in this. Through your analysis of soils, I speak what I think, Virginia has been materially aided in being what she is. The existence of the State Agricultural Society is materially due to your labours. Proud and lofty is the monument. Shall we not preserve it undefiled and unmutilated? Bring up your offerings to the next annual Fair. Let your wives bring also theirs, and your children theirs. Let the last bring garlands woven of the bright flowers of the forest, and the field, and the garden. They will be fit emblems of their own purity, and types of their own brightness and beauty.

At the close of the address, on motion of the President,

Resolved, That the thanks of the Societies be tendered to Ex-President Tyler for the feeling and appropriate manner in which he has addressed the meeting, and that he be requested to furnish a copy of his discourse for publication.

The President reminded the Societies that, as the occasion was one of congratulation and of leave-taking after having enjoyed a delightful season of re-union and social intercourse, while witnessing one of the most successful exhibitions ever held in Virginia, any member present would be gladly heard who had any remarks to make, deemed appropriate to the occasion.

Messrs. Charles Carter Lee, James A. Seddon and Willoughby Newton, each delivered appropriate addresses in answer to calls made on them by the meeting.

And then with the kindest feelings, and with fraternal harmony, the meeting adjourned. CH. B. WILLIAMS, *Sec'y.*

For the Planter.

Profitable Treatment of an Orchard.

A. A. Campbell's annual contribution to the Nottoway Agricultural Club.

Mr. President:

Early in the month of March 1857, I had my apple orchard, containing three and a half acres of land, broken up with a two horse plough, say six or seven inches deep. This lot had been kept for eight years as a grazing lot, during which time a strong sod of wire and other grasses had formed on it; it was cross-plowed, and the heavy drag immediately passed over it; in which situation it was permitted to remain until the 28th, when the harrows were again passed over it, leaving it in fine tilth: the land was in good heart, though not rich. It was then laid off in rows, seven feet apart, with a trowel hoe, and planted in an early variety of corn, brought from the mountains, $2\frac{1}{2}$ feet in the row, two stalks in the hill—and no manure of any kind was used. Between the first and tenth of May, a trowel hoe furrow was run midway between the corn rows, say $3\frac{1}{2}$ feet from the corn and the land planted in the corn-field peas. This piece of land was selected more with the view of benefitting my orchard than the expectation of receiving a remunerating return for my labour. The subsequent cultivation was with the harrows and two hoe workings, all done in good time.

During the last week in July following, I had a three-tooth harrow run between the corn and pea rows; opened a drill with a trowel hoe plough and sowed in the furrows Reese's Manipulated Guano, at the rate of 200 pounds per acre, and immediately followed on with a well constructed Turnip drill, which deposited the turnip seed to my entire satisfaction; at the same time partially incorporating the guano with the loose earth in the drill, by the action of the spout through which the seed pass. The seed were readily covered by an iron tooth garden rake and the operation finished, with but little labour. The subsequent cultivation was only one hoe working at the time of thinning the turnips, which were left in the drill from six to ten inches apart.

As soon as the corn began to get out of the milk state, I commenced cutting down and throwing it to my stock hogs, after having stripped off the blades of as much as would last the hogs three or four days; thus saving a good stack of fodder and giving the turnips more sun and air, and cutting off the draught on the land. My hogs did well on this feed.

It is impossible to say what the land would have produced in corn if it had been permitted to stand until matured. I suppose it would have produced five or six barrels to the acre, my opinion was corroborated by others who saw it. The crop of peas was a beautiful one, supplying a large family abundantly during the season, with that most wholesome and nutritious vegetable, aud in fall affording a good supply of seed peas. After gathering the dried peas, the vines were cut off with tobacco knives, cured and stacked for the stock in winter; they were eaten greedily by cows and sheep.

It only remains to say something of the turnip crop. It will be recollected, by the Club, that the last was an unfavorable year in this county for this crop; the fly and grasshoppers were unusually destructive, notwithstanding which I raised a good crop for the land and season; most of the turnips were large and well-flavoured. The crop was not measured otherwise than by the cart load; and estimating the cart load at twenty-five bushels, the crop amounted to about 300 bushels; these were put up in mounds and covered over with corn-stalks and earth, and have been beneficially fed to my stock during the winter and spring months,—they kept well until the cold spell in March when they rotted badly.

On the 5th day of October 1857, the land having been previously cleared of the corn and peas—the turnips still remaining on the land—was sowed in wheat, at the rate of $1\frac{1}{2}$ bushels per acre, and 200 pounds of well-mixed and thoroughly incorporated Mexican and Icabo guanos, (done in my own guano-house, under my supervision,) in equal quantities by weight, and thoroughly harrowed in. Around and between the turnips the wheat was chopped in with hand hoes. The turnips were gathered by hand in December.

The wheat came up evenly and regularly,

and is at this time (April 27th) a beautiful and promising lot, comparing favorably with my tobacco lots, from which a fine crop is expected if no casualty befals it.

A. A. CAMPBELL.

Specific Manures, &c.

Experiments by W. J. Harris, reported to the Nottoway Club.

MR. PRESIDENT:—An analysis of Tobacco by Mr. W. A. Shepard, of Randolph Macon College, which appeared in a late number of the Planter, agrees so well with some experiments made by me, that I think it will prove a safe guide in the application of specific manures for Tobacco. Not being able to make as much good farm-yard manure or compost as would be necessary for a crop, I have been compelled to make up the deficiency with guano, applied jointly with them, or alone. When guano was used alone, unless the land was very good, the crop always failed to fulfill what might reasonably have been expected from its early growth. It would start off finely and reach a large size, but as soon as the maturing process commenced it begun to *burn* at the bottom, or *fire* at the top; or, if it escaped these disasters, it ripened, or rather dried up, thin and poor. It was evident, therefore, that, although the guano could give it size, it could not ripen it properly. As guano contained very little potash, and Tobacco a great deal, and as wood ashes is known to be one of the best manures for Tobacco, it appeared clear to me that potash and lime, when needed, would supply the deficiency.

The first experiment I made was on a piece of thin, worn-out land, on which I applied a dressing of oak leaves and lime, saltpetre and guano. The oak leaves and lime were applied about two months before the saltpetre and guano. The result was, that I believe I got a better crop than from an ordinary dressing of stable manure. The next experiment was made with saltpetre and salt, and a small quantity of leached ashes—broadcast, and guano in the drill, which made the richest and heaviest Tobacco I ever made from any application. The land on which this was made was a stiff red clay, and probably contained a sufficient quantity of lime. The first was a very poor sandy soil.

Mr. Shepard's analysis shows a very large quantity of potash and lime in both the dried leaf and stalk,—as much as 6 pounds to the 100 pounds; so that an acre of land, to produce 1000 pounds of leaf and 200 pounds of stalk, would have to supply 72 pounds of potash and 72 pounds of lime,—the two making two-thirds of the inorganic elements of the plant.

Salt is no doubt very beneficial as the analysis shows a large per cent. of chlorine and soda. Without being guided by an analysis I had, in the above mixture, everything of importance the analysis calls for. The guano furnished the nitrogen and phosphoric acid to give the growth—the ashes and saltpetre to furnish potash, and salt the chlorine and soda.

From the very large proportion of potash and lime in a well matured leaf and stalk of Tobacco, I think it very probable that a deficiency of these alkalies prevents a proper maturing of the leaf, and brings on *burning, fire* and *starvation*—(to both leaf and planter.)

Saltpetre,	30 to 40 lbs.,	Per acre.
Ashes,	quantum habet,	
Salt,	2 bushels,	
Guano,	200 lbs.,	

Respectfully submitted.

WM. J. HARRIS.

Experiments with Peruvian and Columbian Guano, both Separate and Mixed.

Report of W. R. Bland to the Nottoway Club.

I last fall, about the 12th of October, sowed one and a half acres of land in wheat, dressed with 250 pounds of Columbian guano, at a cost of \$5 62½, one acre and a half dressed with 212 pounds Peruvian guano at a cost of \$5 72, and six acres dressed with a mixture of the two guanos, 550 pounds Columbian and 370 pounds Peruvian, at a cost of \$22 37. The acre and a half dressed with Columbian guano produced five shocks wheat, estimated at two bushels per shock, giving ten bushels, or six and two-third bushels per acre, cost \$5 62, product at \$1 50 per bushel \$15 00, profit \$9 37; profit per acre \$6 25. The acre and a half dressed with Peruvian guano produced five shocks wheat, estimated at three bushels per shock, gives fifteen bushels, or ten bushels per acre; cost of guano \$5 72, 15 bushels wheat, at \$1 50, \$22 50, profit \$16 78; or a profit of \$11 18¾ per acre. The six acres dressed with a mixture of the two guanos, at a cost of \$22 37, produced twenty-four shocks, which, at three bushels per shock, gives seventy-two bushels, which, at \$1 50, gives \$108; profit \$85 63, or a profit of \$14 40¾ per acre.

The three sections of land were of as nearly equal fertility as I could well get, all very poor. If there was any difference, the land on which the separate applications were made was rather the best. The wheat was, I believe, all sown the same day.

WM. R. BLAND.

July 9th, 1857.

Comparative Experiment with Peruvian Guano and Reese's Manipulated Guano.

Reported to the Nottoway Club by T. F. Epes.

On my tobacco lot last year, I tried Peruvian guano on one half, and Reese's Manipulated Guano on the other. That on which the Peruvian guano was applied grew off best. It was topped at ten and twelve leaves. The other was topped at ten and eight. It was most leafy and ripened thicker. Whether attributable to the lower topping or Manipulated Guano I don't know.

T. F. EPES.

May, 1858.

Experiments to Substitute Peruvian Guano (in part) on the Wheat Crop.

Report of Travis H. Epes to the Nottoway Club.

Last fall, Peruvian guano being high, I used 100 pounds of it to the acre on wheat mixed with 50 pounds of Mexican and 50 of Jordan's Superphosphate of Lime. All of the wheat that was seeded before the heavy rain of the first of November looks very well, and is as good (except being a little too thin) as when the same land was in wheat, with 200 pounds of Peruvian guano to the acre. That seeded after the rain looks well and healthy also, and the whole crop is said by many farmers to be the best they have seen.

Respectfully submitted.

TRAVIS H. EPES.

Those who are in the power of evil habits must conquer them as they can; and conquered they must be, or neither wisdom nor happiness can be attained.—*Johnson.*

Toilet Soap.

Take 6 lbs. White soap,
1½ lbs. Sal Soda,
1 table-spoonful Spirits Turpentine,
½ " Hartshorn,
1½ gallons of water.

JELLY SOAP.

24 ozs. water, or 1½ pints,
1 oz. Shaving Soap,
1½ ozs Carb. Soda,
10 grains Pulv. Borax,
5 " " Ammonia,
1½ drachms Spirits Turpentine.

Boil the water and mix the materials well.

The above recipe is taken from an old newspaper, and it is thought to be identical with the celebrated Roraback recipe which is offered for sale all over the country.* It is said the Roraback Soap yields upon analysis nearly 40 per cent. of tallow. This agrees very well with the above recipe, for the common White Soap yields 70 per cent. of tallow. The usual colouring matter of soap, is vermillion. SCHEELE.

[*Independent Blade.*

MR. EDITOR:—You will confer a favour upon one of the readers of the Journal, by publishing the above. By a perusal of it, the Rorabacks can ascertain whether they have been sold or not. It may or may not be correct, but it will do no harm to put people on their guard. Every eight or ten years a sort of soap paroxism convulses the country. Washing made easy, and soap made cheaper than Paddy's brooms, are all the go. All the scientific skill of chemistry has long since been spent upon this vexed question, and soap is still nothing more than the union of an oil and an alkali—call it what you may. The firm white soaps are chiefly made of the olive oil and carbonate soda, common salt being added to promote the granulation and perfect separation of the soap. It is marbled by stirring in a solution of sulp. iron. Common household soaps are made mainly of soda and tallow; or if potash is used, salt is added to harden it. Yellow soap is made by the addition of rosin. Common soft soap is made from potash and any oily substance, or a strong lye made from ashes and any animal oil—the lye is much improved by the addition of

* It is not.—ED. F. & P.

lime to the ash hopper—but soap, made as it may be, must consist of an oil and an alkali.

A considerable stir has been made lately in New York, by developement of the fact in the Supreme Court, that the "Balm of a Thousand Flowers" was nothing but good soap; that it was compounded of greese, lye, sugar and alcohol, dignified with the name of palm oil, potash, &c.

Certainly it must be a money-making business—ten dollars a gallon for an article which can be manufactured for six cents a gallon. So much for a fancy name. "Old women," save your soap grease—fancy detergents are looking up. Give a big name. Call it Mirangipania Humbugifolia, and advertise 1000 certificates from the afflicted, and your fortune is made.

But talking of soapsuds—take one gallon of water, pound of washing soda, and a quarter of a pound of unslacked lime, put them in water and simmer twenty minutes; when cool, pour off the clear fluid into glass or stone ware, (it will ruin earthenware.) Put your clothes in, soak over night, wring them out in the morning, and put them into the wash kettle, with enough water to cover them. To a common sized kettle put a tea-cup full of the fluid; boil half an hour, then wash well through one suds, and rinse thoroughly in two waters, and if you don't give up you are paid for your trouble, I'm mistaken.—*Independent Blade.*

A Fair and Happy Milkmaid

Is a country wench, that is so far from making herself beautiful by art, that one look of her is able to put all face-physic out of countenance. She knows a fair look is but a dumb orator to commend virtue, therefore minds it not. All her excellencies stand in her so silently, as if they had stolen upon her without her knowledge. The lining of her apparel, which is herself, is far better than outsides of tissue; for though she be not arrayed in the spoil of the silkworm, she is decked in innocence, a far better wearing. She doth not, with lying long in bed, spoil both her complexion and conditions: nature hath taught her, too, immoderate sleep is rust to the soul; she rises therefore with Chanticlere, her dame's cock, and at night makes the lamb her curfew. In milking a cow, and strianing the teats through her fingers, it seems that so sweet a milk-press makes the milk whiter or sweeter; for never came almondgore or aromatic ointment on her palm to taint it. The golden ears of corn fall and kiss her feet when she reaps them, as if they wished to be bound and lead prisoners by the same hand that felled them. Her breath is her own, which scents all the year long of June, like a new-made hay-cock. She makes her hand hard with labour, and her heart soft with pity; and when winter evenings fall early, sitting at her merry wheel, she sings defiance to the giddy wheel of fortune. She doth all things with so sweet a grace, it seems ignorance will not suffer her to do ill, being her mind is to do well. She bestows her year's wages at next fair, and in choosing her garments, counts no bravery in the world like decency. The garden and bee-hive are all her physic and surgery, and she lives the longer for it. She dares go alone and unfold sheep in the night, and fears no manner of ill, because she means none; yet to say truth, she is never alone, but is still accompanied with old songs, honest thoughts, and prayers, but short ones; yet they have their efficacy, in that they are palled with ensuing idle cogitations. Lastly, her dreams are so chaste, that she dare tell them; only a Friday's dream is all her superstition; that she conceals for fear of anger. Thus lives she, and all her care is, she may die in the spring-time, to have store of flowers stuck upon her winding-sheet.—*Overbury.*

Benevolence.

When thou considerest thy wants, when thou beholdest thy imperfections, acknowledge his goodness, O Man! who honoured thee with reason, endowed thee with speech, and placed thee in society to receive and confer reciprocal helps and mutual obligations.

Thy food, thy clothing, thy convenience of habitation, thy protection from the injuries, thy enjoyment of the comforts and the pleasures of life, thou owest to the assistance of others, and couldest not enjoy but in the bands of society. It is thy duty, therefore, to be friendly to mankind, as it is thy interest that men should be friendly to thee.

As the rose breatheth sweetness from its own nature, so the heart of a benevolent man produceth good works.—*Dodsley.*

SILESIAN EWES.

The above engraving represents a group of Silesian Ewes, exhibited at the late State Fair at Petersburg, by S. S. Bradford, Esq., of Culpeper.

Mr. B. has lately purchased largely of this variety of fine wool sheep from the celebrated flocks of George Campbell of Vermont, and William Chamberlain of New York. These gentlemen, by careful breeding and judicious management, have now, it is said, as pure blooded flocks as are to be found in this country. Indeed, such is their high character for purity, that orders are annually received by their owners from Ohio, Pennsylvania, Kentucky, Michigan, California, Texas, and even from Buenos Ayres.

These sheep are hardy and easily kept, producing short wool, but of very fine staple, which is highly valued by the manufacturer.

This group attracted great admiration at the Fair, and were considered equal to any specimen of fine wools ever exhibited in Virginia.

The introduction of wool-growing in Eastern Virginia has been but partial, and the experiments in sheep-husbandry not always satisfactory. The fine wool sheep introduced have been chiefly of the Saxon variety, which, while distinguished for their fineness of fleece, have been liable to the strong objection of weak constitutions, and the unusual mortality consequent upon that infirmity, heightened by the neglect which too generally prevailed of allowing them indifferent and insufficient food, and leaving them exposed to the inclemency of winter without the protection of any kind of shelter. Of course they were unprofitable, both for "flesh and fleece." Mr. Bradford was not discouraged by these disadvantages. He resolved to persevere in his efforts to improve the character of his flock, giving special attention to those points in which he saw its deficiencies. He believed that a hardier race might be produced, which, by proper attention, would repay the expense of their keep, even upon a much more liberal scale of expenditure than had yet been essayed.

In pursuance of these views he sent to Germany and procured a regularly disciplined and experienced shepherd. He purchased of Mr. Campbell and other good flock masters in Vermont, some pure blooded Spanish Merinos, brought them to Virginia and gave them good feed and shelter and careful attention. Very soon the improvement both of his flock and of his farm, began to attract the attention of his neighbors, and Mr. Bradford found himself in receipt of a handsome income from the produce of his flock.

When some years ago he introduced sheep upon his farm, Mr. B. says it was in a very exhausted, naked, and unproductive condition; now his pastures are thickly coated with fine sward, and his cultivated fields yield him more wheat and corn than when the whole farm was appropriated to the production of these cereals. Although his land has been greatly enhanced in value by thorough under-drainage of all the low grounds, by very deep ploughing and a general system of good culture, yet, he thinks his flock of sheep has enabled him to increase the general productiveness of his farm much more rapidly than he could possibly have done by any other system. Mr. B. has good warm, dry shelters for his sheep; during winter they are every night and morning fed under these, in racks and troughs, so constructed as to prevent any considerable loss of hay and other food. These sheds are kept well littered with straw, leaves or other coarse material most easily obtained, and once or twice a week are dusted with plaster, and occasionally with a sprinkling of crushed bones, which greatly improves the value of the manure. During summer the sheep are housed of cold wet nights, and at any time while raining, and never turned out to grass of mornings until the dew is off the grass,—eating of dewy or frozen grass, and exposure to wet weather, being considered injurious to their health. In all good weather of summer, his sheep sleep out on the fields in light, portable hurdles. During this season, his shepherd, with his dog and gun, sleeps by the flock in a small house on wheels, which by means of a yoke of steers, is moved along with the sheep fold, and enables him perfectly to protect the sheep against the trespasses of dogs and thieves.

As soon as the oat crop is removed, the flock is turned on the stubble to sleep, selecting the thinnest portions, until it is all ploughed and seeded down in wheat—during this period of between two and three months, a flock of 1,000 sheep, will sleep over some 25 or 30 acres, and will fertilize them as well, Mr. B. thinks, for the production of the wheat crop, as an application of 200 pounds guano per acre, and much better and more permanently for the ensuing grass crop. Under this system, it is obvious that wool-growing can not be unprofitable. The average yield of his flock, Mr. B. says, is from 4½ to 5 pounds of washed wool, which usually finds ready sale at about 50 cents per pound.

In the old wool-growing States, where sheep receive proper attention, and the utmost care and judgment are exercised in selection and breeding, there are choice flocks which yield annually an average of 6 pounds, and a few as high as 7 pounds of washed wool.

In endeavoring to obtain as large a yield of wool as is practicable, regard must be had to good condition as well as to blood—for sheep, like other animals, other things being equal, remunerate their owners in proportion to the care bestowed upon them; wool will not grow while the animal has food sufficient only to keep it in a breathing condition—the demands of vitality must first be supplied, and it is only by increasing the food beyond this point that we can hope to realize a profit from wool or flesh; even in the pure Merino of different folds, the amount of wool would vary considerably, accordingly as they had been well or badly kept and bred in years past. The proportion, too, of lambs reared, varies greatly in different years, under different treatment. Mortality amongst them is frequently very great when neglected in cold wet seasons; the ordinary loss is perhaps as high as 15 or 20 per cent; but this can be greatly reduced by a provision of wholesome and nutritious food and warm dry shelters, with careful attention during lambing season. There is no reason in nature, Mr. B. thinks, why there should be a greater mortality with them than with calves and pigs, and one explanation of ordinary mortality may usually be found in the neglect or mismanagement of the breeder. It is a law of nature that animals require nutrition in proportion to their natural weight of carcass, but no animal known to the economy of our agriculture can be maintained with so much ease and so little expense as the Merino sheep; nor is there any in which there is so little waste and so little loss. They will thrive on tracts where neat cattle would starve. Bushes, briars, and coarse herbage, which infest our lands, are extirpated by them, and white clover, blue grass and green sward rapidly introduced. The continued pressure of their feet consolidates without penetrating the earth, and the uniform dropping of their liquid and solid excrements over its surface maintains the land in constant progression in fertility and value. The extent of profit to be derived from wool-growing depends much, of course, upon the scale in the prices of wool, as well as the kind of sheep and the condition in which they are kept; but our observation satisfies us that even at the present comparatively low prices, few occupations can be more remunerative or attractive to the farmer than raising fine wool and sheep.

For the Southern Planter.

Facts for the Curious; or Remarkable Peculiarities of Four Cows.

I have intended, Mr. Editor, for some time, to make public, through your columns, the remarkable facts which have occurred, under my own observation, in relation to four cows, the history of which I am about to narrate. Some of these facts are so strange, as almost to overleap the bounds of credibility, yet I shall give them, under the sanction of my own name, and hold myself responsible for their truth. As truth is sometimes stranger than fiction, it only *proves* that the silent workings of Providence are often far beyond the utmost contrivings of man.

But to the facts proposed. Some years ago, I had a very good milch cow, of the scrub breed, whose constant habit it was, to give milk literally, from calf to calf, without cessation. On one occasion, I remember distinctly, to have seen her give *good, white milk*, at night, and in the morning ensuing, she had a calf; and so continued on. One striking effect of this habit of hers was, that her calves were always small and poor. But independent of that, I esteemed her very much, for she was always "Charley at the rack." So much for the first fact. Now for the second. Some few years ago, I had a Short Horn Durham cow, that after having a calf or two, appeared to be with calf again; and observing one evening when the cattle were penned, that she was suffering very much from the great distention of her udder, I very naturally supposed that she had calved, and had hid the calf in the pasture; and had been driven up without it.—In the morning, I directed a servant to drive her to the pasture, and bring her back, with the calf. He drove her to the pasture as directed, but after a while returned, saying that the cow showed no disposition to go to the calf; that he had searched the field, but could find none. I directed him to take the dogs to the field and set them after her, knowing, that instinct, would cause her to run directly to the calf, if it was hid. He returned again however, with no better success than before. I then had the cow milked, supposing that she had lost the calf by some casualty; and that in a short time I should see the buzzards after it. I watched for some days, but saw no sign of the supposed lost calf. Well, here was a mystery I could not solve, so I pocketed it, but had no satisfactory solution of it until the expiration of five years; and here it is. The cow gave her usual quantity of milk for 18 months, (which is the usual time all my cows milk between their calves,) when she was turned dry to calve again. This she did in due time, bearing a female calf, which I now own. At three years old, this calf, now a heifer, also appeared to be with calf; but when the time came to calve, she also had none. So I was compelled to have her milked, to keep her bag from spoiling. This brought back fresh to my memory the conduct of her mother, but only tended to increase the mystery. For, although I have a great fondness for stock, and have read every thing that I could lay my hand on, published either in this country or Europe, I had never seen, heard, nor read of a cow that had come to her milk, but from having a calf, or some other exciting cause. So I stuck a peg there, and determined, if I ever had another opportunity of observing, to put the matter beyond all cavil. In due course of time she was bulled, and again appeared to be pregnant.

On closely observing my other cattle, I found another heifer that I thought would calve about the same time, so I had them turned into my yard to keep each other company, in their state of family solicitude, where I might have a full opportunity of watching the denouement. In due time the other heifer had a calf, but still the *inexplicable* held on, until it became apparent that her bag would certainly spoil unless I had her milked, which was accordingly done.—Not until then was the mystery entirely solved. I had read of cases in the medical books, of women having false conceptions, and passing what is called a *mole;* but this cow had no appearance of having passed any thing of that sort. So much for the third fact.

And now for the fourth. Some years ago, I happened in Lynchburg, Va., and on meeting with my old friend, Mr. John M. Warrick, we soon got into a conversation on the subject of improved stock; and at his request, I rode out with him to his farm, to see his herd of Durhams. After pointing out to me several fine animals, he called my attention to a pair of twin heifers, then about two years old, with very large udders. I asked him if they had not been bulled; he said they had not. I remarked to him that they evidently had milk in their bags, and requested him to have one of them driven to his lot in town and regularly milked, which he readily promised to do. He asked me if I had ever known a heifer to give milk under similar circumstances. I replied I had not, but that I once had a yearling heifer that was kept in my orchard, with some young calves, and one of them brought her to her milk by repeatedly sucking her, and I had some where read of a case of an old grandmother who had not borne a child for many years, having been brought to her milk again by taking a motherless child to sleep with her, and giving it the breast to keep it quiet.

The next time I saw Mr. Warrick, he informed me that he had the heifer milked for some time, and finally wishing to breed from her, he had turned her dry.

While upon the subject of cows, it may be proper that I should give some explanation of an incidental remark I made in the first part of this communication—which was that all my cows milked about eighteen months between their calves. Some thirty years ago, I observed that my cows that had annual calves were not worth half as much at the pail as those that intermitted a year. So I determined to correct it, by killing off and selling all the annual breeders. So that now, and for many years past, I have had no cows in my herd of that description.—This, in part, gave rise to another practice of mine, which is different from my neighbours. It is this: I always have cows at the pail, (whose calves had been weaned,) to give milk at night. This makes it convenient and profitable, to let the young calves run with their mothers in the day, and take all the milk in the morning. By this method, the cows and calves are kept quiet all day. I get as much milk, and the calves grow off more thriftily, and are consequently much better prepared to stand the first winter. It always distressed me to ride by a house on a long summer day, and find the cows *lowing* at the fence, and the poor little calves on the other side, in feebler accents, proclaiming the cruelty of their owners.

R. J. GAINES.

Charlotte County, Dec. 21, 1858.

P. S.—At some future time, Mr. Editor, if I can overcome my great aversion to writing, I should like to give you some experiments I have been making, in the improvement of worn out land, by the repeated applications of guano alone. R. J. G.

[We shall feel very much obliged if our esteemed correspondent will overcome his aversion to writing, and will favor our readers with the result of his experience in the important work of reclaiming exhausted lands—a subject of almost universal interest to the readers of the *Planter*.—EDITOR.]

For the Southern Planter.

Lard Cured with Soda.

Mr. Editor—I find on page 690 of the November number of the *Southern Planter*, in an article on "Curing Lard with Soda," the following sentence: "To every gallon of lard, before it is washed, put one ounce of sal soda, dissolved in one gil of water; the fat needs no other washing or soaking than that just before being put on to cook."

Please let me know what is meant—must the sal soda be put in and then washed out? or must the fat be washed and the soda put with it in the pot.

You will oblige more than one of your subscribers by complying with the above request. Respectfully, W.

We have seen but one specimen of lard cured by the recipe referred to. That was beautifully white, and as nice as it could be. The fat was washed to free it from blood, &c., *before* it was put on to boil, and the soda was mixed with water according to the proportions directed by the recipe in our November number, and stirred into the pot of fat only half full, after it was hung over the fire.

We suppose that the chief benefit derived from the soda is the neutralization of some one, or all, of the acids probably evolved in the process of boiling, and of which there are three, viz: margaric, oleic and stearic. Certainly lard cured after this formulary is whiter, and nicer than any other we have ever seen.

For the Southern Planter.

Is the Cultivation of Oats in an Orchard Injurious to Peach Trees?

GLOUCESTER, Nov. 29, 1858.

Mr. Editor—I am anxious to obtain some information on the subject of the treatment of the Peach tree, and would be grateful if you will answer some questions.

Do you know of any reason why oats should be injurious to a peach orchard?—Some of my neighbours have advised me against cultivating oats in my orchard, and have given as a reason that it would ruin it. I have, with considerable trouble and expense, raised a fine orchard of choice fruit, and would dislike to injure it.

Do you know of any instance where the plan has been pursued with injury or otherwise? My plan was to sow oats, and turn the hogs in as soon as they were ripe, which would be in time for the peaches as they commenced falling.

I saw some time since in your paper, or the "Farmer," I do not recollect which, that a solution of potash, strong enough to bear an egg, was the best wash for the body of the tree. Have you ever tried it, or do you know any body who has? When should it be applied? Have you ever tried the plan of drawing the earth away from the roots of the tree, to destroy the worms? Does it answer, and if so, how long should the roots be exposed, and how much of them? By answering the above queries, you will much oblige a subscriber.

W. F. JONES.

SOUTHERN GREENWOOD NURSERY,
Richmond, Va., Dec. 21, 1858.

Mr. Editor—In reply to the inquiries made by Mr. W. F. Jones, relative to the treatment of fruit trees, I can say, that I have known several instances where persons have planted good, thrifty, fruit trees in November, or early in the Spring, then sowed the ground with oats, and by the time it was matured, the trees were nearly all dead, owing, in my opinion, to the obstruction of a free circulation of air, and the atmosphere being filled with something exhaled by the oats while in a growing state, which is instantly absorbed by the tree acting as a poison thereto; yet at present it is difficult to say what *that something* is, I only *know such to be facts*, while trees planted under the same circumstances, except that the ground was cultivated in peas and potatoes, become healthy and vigorous. I have also known instances, where the cultivation of oats in orchards of more advanced age has had similar effects, though not so instantly fatal. I would recommend the entire prohibition of all crops in an orchard, except peas, potatoes, or cabbage, and in some instances, tobacco. I have been using strong soap-suds as a wash for the bodies of fruit trees for the last fifteen years, and from the advantageous results arising therefrom, I most *heartily recommend* it as superior to any other for that purpose. This should be applied with a coarse cloth during the growing season, viz: May, July, and the latter part of August.

By observation and experience, I have found it very essential to the health, vigour, and longevity of the peach tree, that the earth be taken from the body during the months of Dec'r, Jan'ry and February, thus exposing the top of the main roots from two to six inches, according to the size of the tree, after which, take all remaining insects from the body and roots with a knife or chisel, and throw upon them a half peck of leached ashes, or a small quantity of lime, previous to returning the top soil.

By a strict adherence to the above suggestions, trees can be made to retain a thrifty and fruitful condition to an advanced age. Yours, truly,

LEWIS TUDOR.

Quantity and Value of the Manure of Cattle.

Since the publication of our article on this subject (Co. Gent. of March 5th, and Cult. of April), we have found the following remarks in the report of a recent discussion at a meeting of the London Farmers' Club, England. The gentleman who opened the discussion, Mr. Baker, is reported to have said that he had found, on investigation, that a cow feeding on 100 lbs of grass gave 71 lbs of solid and liquid deposit. An ox would produce 1¼ cwt. while feeding on turnips or mangold wurtzel with 24 to 28 lbs. of solid straw daily; or, in all, about 150 lbs. of solid and liquid manure would be produced by an ox daily. (This, we presume, is true only of an ox of very large size, and weighing about 2000 lbs.) An ox, if kept feeding continually on turnips, grain, and hay, in the ordinary mode, would produce in the seven months of winter about twelve tons of manure; and if foddered in summer about seven tons more. Thus a large ox would produce, altogether, about 19 tons in the yard. In feeding in boxes an ox of average weight, it was said, would produce about 11 cubic yards of manure in four months, or 33 cubic yards if kept constantly in a box for the whole year.

In reference to the value of manures from farm stock, it was remarked that horses was much superior to that from oxen, and that from oxen superior to that from cows, and that from old or full-grown animals far superior to that from young animals. A cow in feeding extracts a larger quantity of the nutritive qualities of food than an ox, because food passes more rapidly into the form of milk than that of muscle or flesh and fat. Again, nearly all the food consumed by full-grown animals goes to supply the natural waste of the system, whereas much of that consumed by younger ones is absorbed in the formation of additions to the bones, flesh and fat, and this is the reason why the richest manure is produced by animals already fat and full-grown.

In the feeding of horses it has been found, said Mr. Baker, that this animal produced in solid and liquid deposits taken together three-fourths in weight of what it ate and drank. A well-fed horse would give 9½ tons of solid and liquid manure per annum; and if to this were added about 2½ tons of straw or other litter, the whole amount made by a horse in a stable in the course of a year might be estimated at 12 tons.

In our former paper the two following results were obtained from collating a variety of observations made by different individuals: 1. That an average size cow, or one fed chiefly on hay and allowed water freely, will make about two and a half pounds of solid manure for each pound of hay, or its equivalent consumed, or, allowing one-fifth for difference between it and in the usual state of dryness, about two pounds for each pound of hay consumed. 2. That the value of the manure made by a medium sized cow in the course of a year would be according to the usual modes of estimating ammonia, potash and phosphoric acid, equal to between $20 and $23, or a little over $10 in the course of the six moths of winter.

A comparison of the somewhat loose estimates which we have quoted, with the results which we obtained as to *quantity* from collating several observations of the highest degree of accuracy and reliability, will furnish additional grounds of confidence in the conclusions at which we arrived. In making any estimates based on these conclusions as to the *quantity* of manure made by animals fed in stables or at distilleries during the winter, it should be recollected that our conclusions refer to medium sized animals, cows or cattle rather under than over the weight of 1,000 lbs. If the application is to be made to the case of large oxen, from 1,400 to 2,000 lbs., a corresponding allowance must be made according to the gross weight and the greater quantity of food consumed.

As it may seem to many that the estimate given in our former article, as to the *value* of the total deposits, solid and liquid, of a medium sized cow or ox during the course of a year, must be too high, we wish to remind such of the fact, that according to the usual modes of managing manure, far more than half its value is dissipated by exposure to rain, sun and wind, while the liquid portion is seldom saved at all. As manures are usually managed, there is little wonder that some should think them hardly worth hauling and spreading. The virtue has gone out of them.

Then, again, it should be remembered in estimating the value of manures that much, very much, depends on the nature of the food consumed. The more nitrogen there is in the food, the more ammonia will there be in the manure. A cow or ox fed on straw, poor hay, and no grain, will yield manure of much less value than one fed on richer food, with oil-cake, &c.—*Country Gentlemen.*

Keep the Stable Floors Clean.

We know divers people who take some pride in their horses and cattle, but are inveterate slovens in their stables. Their racks and mangers are so made that half the hay they give their stock is wasted under their feet. They don't clean their stables but once a week or fortnight.

We have, indeed, seen stables, where valuable animals were kept, not cleaned out during the winter, and the heels of the poor beast stood a foot higher than their fore feet in the latter part of the season. We once hired a barn—a nice, newly built barn—of a man for the winter, and when we went to put our stock into it, found that the horse stable sill was more than two feet above the ground, and the poor beast had to leap that to get into it, and fall down or make a leap every time they went out of it; and also, that full eighteen inches of solid horse dung had to be thrown out, taking a man half a day to do it before we could use it; besides repairing the entrance by a bridge that they could walk in and out upon. We scolded the owner soundly for laziness—it was nothing else—and he only answered that "he hadn't time to clean it, and did not see what harm it did the horses!" And yet when we came to settle with him in the spring, he wanted some dollars extra because we used a part of his barn door to mix cut feed upon, on the plea that in wetting it for mixing, it rotted the floor during the winter! His half a dozen loads of horse dung, seething and fermenting through a long hot summer, didn't rot the stable floor.

A stable where stock is kept should be cleaned out once a day, at least, and twice if the animals stand in it day and night. In all our stable practice, we clean the stable twice a day and shake up the bedding, let the weather be as it will. On the floors of our calf and sheep stables we scatter dry litter, and when thoroughly soiled and saturated, we clean it out and supply its place with fresh. The ammonia arising from the stale of stock in the stables, becomes, in a very short time, very offensive to them, as it is to ourselves. It penetrates their lungs and gives them disease. Its pungency affects their eyes, making them sore and irritable, and is a positive injury, to say nothing of the slovenliness of leaving the stables unclean. Cleanliness, indeed, is as necessary to beast as to man. No creature can thrive when fouled and besmeared with ordure.

Where horses (not mares) and oxen stand regularly, holes should be bored through the floor to let their stale run through on to muck below, or into a trench by which it may pass off and be saved. Otherwise, it remains under them to make them uncomfortable when they lie down, unless they have bedding enough to fully absorb it, which is not always convenient. Our own plan of stable flooring is to raise that part on which the animals stand two inches—the thickness of the plank—above the passage behind, and sloping from the foot of the manger back, to give a fall of one or two inches in the distance of six or seven feet of floor on which they stand, to admit the stale to pass off readily, as well as to let the droppings on to the lower level behind them.—*Maine Farmer.*

Absorbent Power of Soils.

Absorption, defined by Webster as "the act or process of imbibing by substances which drink in and retain liquids," is a quality possessed by all soils in a greater or less degree. And of this difference in capacity, especially as regards absorbing and retaining manures, something has long been known, and has given rise to the application of the terms "hungry" and "quick," to loose and gravelly soils, because they do not long show the effect, and speedily manifest the action of manures, while clays were said to "hold" the fertilizing matters applied. The investigations of chemistry show that beside what would naturally result from the different mechanical action—the compactness or porosity of the soil—there are differences in their chemical affinities for acids, alkalies and gases, which vary their power of absorbing and retaining the elements of fertility derived from manures.

Loamy and aluminous soils were found by Prof. Way to possess the power, when used as a leach or filter, of retaining the ammonia, phosphoric acid, potash, etc., contained in the drainage of a London sewer—the very elements most valuable for manure—and to have the wonderful property, not only to select, but to retain these elements against every power naturally brought to bear upon them, save the growth of plants themselves. "A power," he remarks, "is here found to reside in soils, by virtue of which not only is rain unable to wash out of them those soluble ingredients forming a necessary condition of vegetation, but even these compounds, when introduced artificially by manures, are laid hold of any loss, either by rain or evaporation."

These conclusions seem to show that on most soils (one class of experiments was made with light loam) manure may be applied at any time in the season with equal good results—that there is no danger of loss when actually mixed with the soil, either by filtration or evaporation. Further experiments are needed to prove the absolute correctness of these conclusions to the general mind, but there are those who believe they may act upon them with safety. If established, much labor may be saved in the application of manures. They may be drawn in the fall and plowed under, or left spread upon the surface, or may be distributed in winter instead of immediately before planting and sowing, which is ever the most hurrying season of the year. For ourself, on clays or heavy lands, we would not hesitate to act upon these suggestions.

Some experiments tried in England several years since by Mr. Thomson, to ascertain the power of the soil to retain unimpaired in value, manure applied during winter, and also its power to hold in *suspension* the fixed ammonia of barnyard tanks and manure heaps, resulted in the following deductions;—1. That clay soils might be manured a considerable time before sowing without loss. 2. That light, shallow soils should not be manured heavily at one time; and the manure should be kept as near the surface as possible without leaving it uncovered. 3. That it is desirable to deepen the cultivated soil on all light land, as it thus gives it a greater power of retaining manure.

That all soils possess considerable power of absorbing and retaining manure, is well known; but the great question of the most economical application of different fertilizers is, and will long remain an open one, and one upon which every farmer can do more or less to satisfy himself by practical experiment.—Let those who can, throw light upon the subject, for it is one of large importance in agriculture.—*Country Gentlemen.*

Water Proof Clothing for Negroes.

We give from the *Scientific American* the following method of rendering negro clothing proof against dews and showers:

"Take one pound of wheat bran and one ounce of glue, and boil them in three gallons of water in a tin vessel for half an hour. Now lift the vessel from the fire, and set aside for ten minutes; during this period the bran will fall to the bottom, leaving a clear liquid above, which is to be poured off, and the bran thrown away; one pound of bar soap cut to small pieces is to be dissolved in it. The liquor may be put on the fire in the tin pan, and stirred until all the soap is dissolved. In another vessel one pound of alum is dissolved in half a gallon of water; this is added to the soap-bran liquid while it is boiling, and all well stirred; this forms the water-proofing liquid. It is used while cool. The textile fabric to be rendered water proof is immersed in it, and pressed between the bands until it is perfectly saturated. It is now wrung, to squeeze out as much of the free liquor as possible; then shaken or stretched, and hung up to dry in a warm room, or in a dry atmosphere out doors. When dry, the fabric or cloth, so treated, will repel rain and moisture, but allow the air or perspiration to pass through it.

"The alum, gluten, gelatine and soap unite together, and form an insoluble compound, which coats every fibre of the textile fabric, and when dry, repels water like the natural oil in the feathers of a duck. There are various substances which are soluble in water singly, but when combined form insoluble compounds, and *vice versa.* Alum, soap and gelatine are soluble in water singly, but form insoluble compounds when united chemically. Oil is insoluble in water singly, but combined with caustic, soda or potash, it forms a soluble soap. Such are some of the useful curiosities of chemistry."

Soil of the South.

Seventh Annual Meeting.

The United States Agricultural Society will hold its Seventh Annual Meeting in the Lecture Room of the Smithsonian Institution, at Washington city, on Wednesday, the 12th day of January, 1859, when the election of officers will be held, and the business required by the constitution of the Society will be transacted.

Officers and Members of the Society are respectfully notified to attend, and a cordial invitation is extended to State and other Agricultural Associations to send Delegates, that there may be a general representation of Agriculturists "in Congress assembled," to protect and sustain their interests, acting as a national organization on such matters pertaining to Agriculture as may be deemed appropriate. Gentlemen from other lands who may be interested in the acquisition and diffusion of Agricultural knowledge, are also invited to attend, and to participate in the proceedings.

The Medals and Diplomas awarded at the Sixth Annual Exhibition at Richmond, will be delivered to successful competitors, or their agents. The published volume of Transactions for 1858, will be delivered to Members of the Society, and to gentlemen connected with the Agricultural Press.

Important Agricultural topics will be publicly discussed, after introductory remarks by eminent scientific and practical agriculturists. Gentlemen having other topics pertinent to the advancement of Agriculture, which they may wish to introduce or to have discussed, will please refer them to the Executive Committee, through the Secretary, that a place may be assigned them on the daily programme.

Delegates are requested to bring copies of the publications of the Societies which they represent—one for the Library of the United States Society, and others for foreign and home interchange.

Propositions from cities at which the next Annual Exhibition of the Society is desired, will be received and considered.

The Business Office of the Society is in Todd's Marble Building, one door west of Brown's Hotel, Pennsylvania Avenue, where all interested in the cause of Agricultural improvement are invited to call when in Washington city. A large number of Agricultural newspapers, periodicals and reports, (liberally contributed,) are placed on file for public inspection, and the Library is also free to all who may desire to examine it. Models or Drawings of Agricultural Implements, and other objects of interest, are placed on exhibition without charge.

Gentlemen who may wish to become Life Members of the Society, can do so by paying or remitting ten dollars to the Treasurer, Hon. B. B. French, Washington city. This will entitle them without any further payments, to the full privilege of membership—among these are: free admission to all exhibitions of the Society, the annual volumes of published Transactions, the Monthly Bulletin, and the large and elegant Diploma. The fee for Annual Membership is two dollars, which ensures the receipt of the

Transactions and the Monthly Bulletin for one year.

The Southern Planter.

RICHMOND, VIRGINIA.

Happy New Year.

Since the issue of our last No., another year, with all its concomitant circumstances of joy, grief, and toil: of pleasures, disappointments, and trials, has fled into the dim shadow of the past. We may remember, but cannot recall its hours. Yet time has laid upon us the burden and responsibility of both the number and occupation of its days. Happy he who, in a retrospective glance, finds nothing to regret of greater moment than the increase of grey hairs, which serve to warn him of the sure approach of life's winter, and an honorable old age. Of time past, the recording angel has made up his account; and we trust that in his sympathy for erring humanity, he has "dropped a tear" over the list of our short comings, and "blotted out the record forever," leaving life's page unblemished by marks of misspent time.

In tendering to our patrons "the compliments of the season," we wish them the enjoyment of all the best blessings of a beneficent Providence, and that they may so occupy the hours of the year now before them, as to secure for themselves, and those dependent on them, an increase of happiness, prosperity, and contentment.

"That they may live thro' many a joyous year,
While health and happiness their steps attend—
May sleep with lids unsullied by a tear,
With naught to grieve the heart, naught to offend."

A few words as to our own connection with the large and respectable class of our readers, may not now be improper. For six months past, it has been our duty to lay before them whatever we could collect of an agricultural character, which, in our humble judgment, we deemed best calculated to benefit, instruct, or amuse them. Of the measure of success attending our efforts, we may not speak, but we may honestly say, we have done our best to acquit ourselves of the task with fidelity and diligence—while, with a painful consciousness of having fallen far short of our wishes in the scale of excellence, we may ask them to "pass our imperfections by."

To many of our subscribers we are indebted for words of encouragement and good will, which have been gratefully received as "words spoken in season." These cheer us on, and tend to make of our labors, a labor of love.

Thus may there ever be, between our patrons and ourselves, a reciprocity of kindly feelings, and good offices, while our time is profitably employed under the direction of the "Lord of the harvest." May we be gathered in His sheaves, and stored in His Garner, when time shall be no longer; and until this change shall come, may we never fail to attain the fullest fruition of a happy New Year.

Special Notice.

TO SUBSCRIBERS IN ARREAR.

To every subscriber who shall send us, *before the first day of February next*, the amount now due us, together with his subscription for *the present year*, we will send with the receipt Postage stamps sufficient to pay the postage on the volume for 1859.

We hope they will *all* avail themselves of this offer. There are *many* of them in arrear, and their prompt attention to this matter will greatly benefit us.

We have received a pamphlet copy of the Introductory Address of John F. G. Holston, A.M. M.D., Professor of Clinical Surgery in the National Medical College, on the opening of that Institution, delivered in the Hall of the Smithsonian Institute, October 18th, 1858, and published by the unanimous request of the students.

The speaker gives a succinct but lucid and graphic history of medicine, first as an art and then as a science, and enunciates the cardinal points upon which it rests. "The *last* point is, indeed," says the speaker, "the only one strictly scientific and of an endlessly progressive character," namely: "By the process of generalizing, to discover principles or primary truths applicable to the explanation of all observed phenomena." He repudiates, with merited scorn, the *isms* and *pathies*, the *nostrum monger-*

ing and *specialisms* of our day, as having their antitype in the superstitious empiricism of Egypt, and extols the science of medicine as a "Godlike science, studying the relation of cause and effect by a system of severe induction, and rallying all the sciences around her, as subservient handmaids."

Cosmopolitan Art Journal.

A quarterly, devoted to the diffusion of Literature and Art. Containiug in the December issne a number of well written articles, among which we name the following:

Art in America: its History, Condition, and Prospects. By HENRY T. TUCKERMAN.

Character in Scenery: its Relation to the National Mind. By the EDITOR.

Santa Croce: The Westminster Abby of Florence. By O. W. WIGHT.

Nature's Lessons. By Prof. IRA W. ALLEN.

A Ballad: Dainty Jenny Englisheart. By T. B. ALDRICH.

The House with Two Fronts. By ALICE CARY. And *Body and Soul,* (Poetry.) By METTA VICTORIA VICTOR.

It is beautifully illustrated with a number of fine engravings, portraits, &c.: and as a whole, is a very creditable representative of the intelligence and taste of the association under whose auspices it is published. We commend it to every one who desires to cultivate a taste for the beautiful,—a natural instinct of every mind, which, by its educational development, expands its powers, liberalizes, ennobles, and purifies its sentiments, and becomes the source of unalloyed pleasure, as well as the handmaid of Virtue.

We tender our thanks to the Publisher, for a sheet containing lithographic portraits of the eight Bishops of the Methodist Episcopal Church, South. If they are all as true and life-like as the likeness of Bishop Early, whom we have the happiness to know, and to hold in the highest estimation, as well for his personal worth, as "for his work's sake," this publication must be greatly valued as a memorial of these self-denying men of God, who have dedicated themselves to His service in the ministry of the gospel, and to the promotion of the progress and extension of that branch of the Christian Church to which they belong.

We are much pleased with the first number of the "Virginia Farm Journal," and cordially extend to Mr. Crockett the right hand of fellowship. We hope he may be well recompensed for his efforts in the cause of Agriculture, and meet with abundant success in his undertaking.

To Subscribers.

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

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

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

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

AUGUST & WILLIAMS.

To Postmasters and Others.

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

To any person who will send us clubs of

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

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

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

15 *new* subscribers and $30.—
The So. Planter for 1857, '58, and '50, and a copy of the Southern Literary Messenger for one year.

To single new subscribers we will send *the present* volume, (commencing with the numbor for January, 1859,) at the low price of $1 50, *paid in advance.*

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

THE HIDDEN WORLD; *Or the Induction of General Principles from a multitude of Diversified Forms or Appearances.* By ISAAC TAYLOR.

"THE THINGS THAT ARE UNSEEN ARE ETERNAL."

The main prerogative of the human mind is its power of gathering general principles from a multitude of diversified forms or appearances. This faculty, to a greater or less extent, developes itself in all men; but in some is so vigorous that it predominates, and gives law to the dispositions and pursuits; in such instances its exercise is attended with a pleasurable emotion of the most vivid sort. The pre-eminence of the faculty of generalization constitutes what is termed the philosophic character.

The delight wherewith minds of this class contemplate universal truths, or abstract laws, does not so much spring from perceiving that some general principal holds good and reappears in a great number of instances, that very nearly, or perfectly resemble, one the other; as from discovering the occult presence or efficacy of some such principle in a multiplicity of cases which have few points, or perhaps, no other point of alliance beside this one of their obedience to the same general law.

The more there is of external diversity, or unlikeness, or of apparent contrariety among the particular instances that are thus allied by their subjection to a common rule, so much the more of keen satisfaction or delight will be afforded to the mind when it detects the hidden principle of union. And not merely does diversity of *form* enhance the pleasure of generalization, but it is augmented, also, by mere remoteness of time or place. Thus, if we could glance for a moment at the surface of some world immensely distant from our own, and there recognize the operation of the same principles of life and organization with which here we are familiar, this perception of analogy would generate a pleasurable surprise, made the more intense by the recollection of the vast stretch, or wide empire of such common laws

These elements of intellectual enjoyment are richly furnished by the studies of the naturalist. Now, it may be, he compares family with family of the vegetable and animal world; and, after marking the ostensible peculiarities of each, descends beneath the surface of their external differences, and lays open those great and uniform principles of mechanical or chemical structure, to which all are conformed; and (if the figure may be used) he listens, and hears all beings uttering, in their several dialects, one and the same code of physical existence. Or, turning from the present system of things, the lover of nature explores the deep strata of the earth, gathers thence the fossil remains of long extinct tribes, and, with more pleasure than the vulgar can conceive of, or he express, brings to light the unvarying laws of animal organization, as they held their sway ages ago, among orders the most strangely unlike to the species of the recent world. Whether he looks to the extreme distances of space, or of time, the naturalist, after giving a moment to the obvious or common gratification that springs from novelty and diversity, seeks and soon finds the more lasting and substantial pleasures of reason, while marking the oneness and harmony of nature, even where her clothing and her colours, and her proportions have the least of uniformity.

If we might so speak, it is by her *diversities*, her gay adornments, her copious fund of forms, her sportive freaks of shape and colour, that Nature allures the eye of man, while she draws him on to the more arduous, but more noble pursuit of her hidden analogies. *Unlikeness* awakens his attention; *uniformity*, or simplicity, fixes and enchains it; and, by the pleasure it confers, ensures on his part the laborious investigation of abstruse principles.

While the human mind is thus employed, an insensible process goes on, the effect of which is gradually to invest general truths with a sort of majesty, as well as beauty; so that, at length, this new charm rivals and prevails over the graces and attractions of exterior diversity, and imparts more and more force and advantage to that which is occult, until it quite overpowers that which is visible.

Thus it is, that, in the course of philosophical pursuits, abstract principles come forth more into the light—stand out with more distinctness before the mind, and, ere long, the laws which at first were apprehended with some degree of painful effort, occupy it as pleasant and facile matters in the hour of relaxation, as well as engage it in the season of strenuous exertion. At last, whatever is universal prevails altogether over whatever is individual, and the rational faculty, getting released from the disturbance and fascination of things external—accidental—trivial, contemplates with open eye all that is great and permanent.

The whole evidence of our modern physical science serves to establish the belief (a belief in itself highly reasonable) that the mechanical and chemical laws which prevail in our planet, are common to other planets, and to other systems—even the most remote of them; so that, in *this* sense, the inhabitant of any one world would find himself at home in any other: just as the traveller, how much so ever he may be, for a moment, perplexed by diversity of climate, or strangeness of foreign manners, soon confesses that nature and man are essentially the same in the country he has reached, and the country he has left.

But, on the other hand, it cannot well be doubted that the same principle of inexhaustible variety, which as we see, in our world, throws out so many thousand forms of beauty, has also its full play in other worlds, and takes its range as freely in one district of the universe as in another. If so, it follows that, could we visit and explore other regions, or were permitted to tread the fields of space, and to set foot, as pilgrims, upon distant spheres, each newly discovered world must amaze the eye, by its singular fashion, or peculiar aspect, or particular mould of beauty: each would present its proper and distinguishing *style* of symmetry and colour. Nevertheless, beneath all these diversities, and amid the confusion of these special graces, there would still be couched (as the supposition implies) the few great canons of organic combination; so that each planet of all the skies would at once challenge to itself an individuality, and confess its relationship, or bond of alliance, with all the rest.—

—And who shall duly conceive of that emotion of wonder and pleasure, with which the forms and contrivances of so many dissimilar worlds must present to a rational mind what may well be called the majesty or awful force and sanction of those few canons to which we find submission is made in all regions of the material system? In returning to our abode from an excursion such as we have imagined, the familiar objects that adorn it, ceasing to attract the eye by their individuality, would henceforward stand before us as the mere symbols of the abstract truths that had now gained possession of the mind.

We may safely employ the analogy which we have thus drawn from the material world, and transfer it, with its inferences, to the intellectual and spiritual system. And we institute our parallel as follows:—It is not to be questioned that the laws of the Divine Government (not less than the first principles of the material world) are one and the same in all places of the universe; for these laws are nothing else than *expressions* of the Eternal Excellence—its goodness, and wisdom, and purity. As in the Supreme Being there is no variableness, so neither can there be contrariety or opposition of purposes within the circle of his administration. Nevertheless, though the laws and ultimate issue of the moral system must be one and unchanging, and must challenge application to all possible cases, yet it is reasonable to believe that the modes under which this one purpose or rule of the divine government reaches its accomplishment are as various as the worlds wherein it is taking its course are many. In other words, we are compelled to suppose, on the one hand, that the intelligent universe presents an absolute *unity of principle;* and on the other, that it offers infinite dissimilarities of means and events. If each sphere or planet has its own physical character—its peculiar fashion and form, so, doubtless, has each family of intelligent beings its special destiny—its single and peculiar history, and its individual round of fortunes. The ways of Him who sits on the throne of universal dominion are "a great deep," and of his judgments or dispensations "there is no end."

Now, in the very same way that extensive generalization in matters of physical science imparts gradually to universal laws a predominance in the mind over visible appearances and single instances; so, by an analogy of principle, would an extensive knowledge of the intellectual and moral system, as it now exists, or has heretofore developed itself, in other worlds, produce a similar prevalence of abstract truths over the impression of particular facts. If a *moral* instead of a *physical* process of generalization could be pursued by the human mind in its passage from system to system; and if it could listen to the history, witness the condition, and learn the destiny, of thousands and thousands again of immortal tribes, whatever was uniform or fixed in the maxims of the divine government, and which presented itself ever and anew in every world, would, at length, assume to itself a paramount importance, and fill the faculty of rational contemplation almost to the exclusion of lesser objects.

Let it be granted that, for awhile—perhaps long—the spirit of the traveller through the universe would be overpowered by its emotions of amazement and curiosity, in contemplating so many diversities of social constitution—so much strange magnificence; so many new forms of greatness or splendour;—the energies—revolutions—adventures of innumerable families. This must be: but it is certain that a mind constituted like that of man, would, at length (if we may so speak) collapse, or fall in upon its centre; it must return, and take up its proper nature—its innate usages of generalization;—it must court the calmness of *reason*, as a relief from the turmoil, and perplexity, and fatigue, of looking so much abroad. Then would commence that process of the understanding, which digests and simplifies multifarious objects, and by which the burden and distress of too much variety is relieved. Or perhaps, suddenly, in the full course of eager contemplation, the spirit would be arrested by the thought of *the universal law*, which (amid these changing scenes) was displaying its unchanging force; and, as with an instantaneous revulsion, it would at once pass over from things individual and visible, to things invisible and permanent.

In like manner, as from physical generalization, the beautiful (might we say, awful) simplicity of the material world fills the mind with a calm and elevated pleasure; so, and with much more power, would a similar process, carried on while the moral world at large was passing under the eye, bring in upon the heart those universal principles of the divine government which are the expression of the Divine Nature. These principles would gradually come forth from amid the innumerable instances of their efficacy; they would slowly and silently present themselves in a clearer and still clearer light; they would more and more be disengaged from anomalies or exceptions. The unchanging and unsullied glories of absolute purity, wisdom, and benevolence, would with an accelerating augmentation, prevail over the glare and show of individual objects. Whatever is limited, partial, temporary, contingent, accidental, must fade and become dim, or take its proper place of comparative insignificance. Meanwhile, though the SUPREME, who dwelleth in light inaccessible, were not visibly revealed, nevertheless his actual presence, as Ruler of all beings, would be declared in the brightness of his attributes; so that the issue of so large a knowledge of the moral and intellectual system must cause, to the rational spirit—a vanishing of the creation, with its diversities, and a manifestation of the Creator in his unchangeable perfections. Or otherwise to express the same thing, that which is "seen and temporal" would be lost in that which is "unseen and eternal."

Back Numbers of the Southern Planter Wanted.

See the advertisement of J. W. Randolph, on the first page of Advertising Sheet.

AGENTS.

MR. FITZHUGH CATLETT is our authorized agent (at Guiney's Depot, Caroline County,) to receive money for us, and to give receipts. New subscribers are requested to leave their names with him, *daily, if not oftener.*

MR. GEO. C. REID, is our agent in Norfolk, Va.

F. N. WATKINS, Esq., at the office of the Farmer's Bank of Virginia, at Farmville, is our authorized agent to receive money due for subscriptions to this paper, and to grant receipts therefor. Our subscribers in Prince Edward and the counties adjacent will please call on him.

Maj. PHILIP WILLIAMS is our authorized agent to receive subscriptions, and give receipts for us. See his card in our advertising sheet. Our subscribers in Washington City and Georgetown, D. C., will confer a favor on us by settling their bills with him. AUGUST & WILLIAMS.

For the Southern Planter.

The Economy of Working and Gearing Teams.

Mr. Editor—In a former communication I merely hinted at the subject of "Centre Draught," or "The Proper Mode of Gearing Horses and Mules to the Different Vehicles and Implements to which they are worked."

The subject is one in which the community generally and the farming portion of it particularly is deeply interested. Indeed, all would be surprised to see, if I could succeed in demonstrating it, to what an extent they are interested in that which appears at first thought to be but a trifling, insignificant matter. We will assume, without pretending to entire accuracy, that the teams on each farm constitute one-tenth or one-eighth of the whole capital employed on it, requiring the humane and watchful care of their owner to keep them in that healthful vigor and state of flesh which will best develop their strength and activity, and enable them not only to perform well for the time being the work assigned them, but also to preserve them in a thrifty and improved condition that will ensure the long continuance of their ability to discharge their functions properly.

Their intrinsic value, as well as the duration of their service, all must admit, will greatly depend upon the care and protection accorded to them by their owner. Any means, therefore, by the adoption of which one-fourth of the power neutralized or wasted in the ignorant, careless, or injudicious use of these teams may be saved, not only adds proportionally to their value, but economises in like proportion the expense of maintaining them, as well as justifies the curtailment of the number employed. In regard to the gearing of horses or mules and oxen, I refer you to two articles which I published in the Southern Planter of January 1858. These articles explain how teams should be geared to ploughs, wagons, &c., but do not touch on the mode of attaching them to *carts.* On this subject, therefore, I now design to speak particularly. The draught line, as I have before stated, should pass from the shoulder of the horse to the junction of the back and belly band on the traces, precisely at right angles, in order that the pressure on the shoulder by the pulling of the horse may be so steady as to hold the collar and hames firmly in their proper place, thereby avoiding the fruitful source of the chafing and galling which disfigure, and often disable teams, by preventing the slipping of the collar up and down at each alternate step of the animal as he advances. Besides this, the right angle line from the shoulder to these bands, or the place where they should be (which is just behind the shoulder) is the one upon which the horse can exert the greatest amount of power and throw the greatest degree of weight; both of which are essentially necessary in pulling. This being a fact, demonstrated by practice, we will now say that long traces should be used to carts as well as to one-horse wagons, and should be attached to a swingletree in the same manner, in preference to hitching the hame on each side. with a few links of chain directly to the cart shaft. This mode requires the horse to pull the whole load first with one shoulder and then with the other, whereas pulling on the swingletree the pressure is kept up all the while on both shoulders, because the swingletree is fastened on a pivot in the centre, and varies to suit the walking motion of the horse. Again, the long traces can be so fastened by the back and belly bands as to get the power line of the horse, because they are flexible and the shafts are not, and hence the line of traction of the horse *cannot* be gotten when pulling by the shafts. The difference in the two modes is at least twenty-five per cent in favor of the traces. The mode of working one horse before another to a cart, *as practised*, is shocking. Against this practice, I adduce the following simple and plain reason, viz:

When a line is drawn straight from the centre of the resistance of the wheel and axletree to the pulling point at the girth where the traces crook *into the draught line* of the shaft horse, and another line is drawn from the same point of resistance of the wheel and axletree to the *pulling point of the girth* of the front horse where the traces crook upward into his draught line,—the two lines thus described, will be found very far from being parallel with each other. The line running to the front horse's girth will be found to be very much lower than the rear one, because more distant from the centre of resistance of the wheel and axle, and because the centre of resistance of said wheel and axle is not so high generally as the point at the girth where the crook takes place, unless the team be exceedingly low.

Now, instead of running the traces from the girth of the front horse straight on to the centre of resistance of the wheel and axletree, run them to the ends of the cart-shafts, where they generally fasten,—which is some six or eight inches higher than the proper or correct line, and the front horse will exert a part of his strength or power in pulling the load, and a part in pulling a burden on the back of the rear horse. The amount of the lost power of the front horse in burdening the rear one, and the rear one in being burdened by the front one, will be precisely in proportion to the amount of power exerted by the front horse, and the crook or angle (at the end of the shafts) of the line upon which said front horse is pulling.

The amount I will not undertake to determine here, for it is needless to the end I have in view. Suffice it to say, the loss is very great, and may be very easily ascertained at little or no cost. The remedy is too simple to need explanation. But if it be necessary, I will most cheerfully give it at some future day either by drawing or otherwise.

In conclusion, I would most seriously urge the users of horses to turn their attention to this subject. It is one fraught with momentous benefits, in accomplishing greater results with their horses, and in keeping them in better condition and causing them to be far more durable.

OBSERVER.

Compliment to Virginia Farmers.

In looking over a recent number of the Boston Congregationalist, we were very agreeably surprised to find in it the following complementary remarks on Virginia Farmers. We had seen in that paper so many things of a very different caste, whenever it has spoken of the South, that we were not prepared to find in its columns the testimony of a Northern man, who is impartial and independent enough to see and report things, just as he found them at the late Agricultural Fair in Richmond. We hope he will advise our New England brethren to visit the Southern Planters and take a "*South side*" view of things. It can do them no harm. Let us hear him:

"After enjoying a good and ample opportunity for observation, I feel no hesitation in saying, that physically, and socially, the Southern farmers are more genial and sociable than they are East or West, judging from observation. They impress a Northerner, that they enjoy life better, and are really and substantially, a happier people than the inhabitants of the East or West. I never saw so many large and well-proportioned men, physically, and such uniformity of genial, good-natured faces, as at Richmond. This quantity of graceful good-nature, was one of the most attractive, pleasing, and interesting characteristics of Southern farmers. Would that our excellent New Englanders, engaged in the same occupation, would cultivate the same genial graces. A sad face, certainly, ill becomes one who lives, and moves, and has his being among plants, and trees, and flowers, and fruits and grains, and singing birds, and shrilling insects, and creeping reptiles, —amid a world adorned with beauty, and vocal with song. If any class above all, have special reasons for being genial and cheerful, and sociable, and running over, as it were, with peaceful good-will toward all men, it is the farmers. For them, then, there is no really good apology for their going about with a sad countenance, and clad with silence, as it were, with a garment.

More skill is manifested in farming and gardening at the South, than I expected to see. In stock breeding, whether of cattle, or horses, or mules, New England would, most likely, come off second best in a fair comparison. In Short Horns and Devons, old Virginia and Maryland may challenge the East and the West, without fear of being beaten in quality. They rank high, also, in the production of fine horses, as was demonstrated at the Fair.

Sheep-culture and wool-growing have been recently and successfully introduced into some parts of Virgina. One farmer informed me that he had recently stocked his farm with about a thousand fine-wooled sheep, and now raises more wheat than when he kept no sheep. He finds them excellent renovators of the soil, in reclaiming worn land, and rendering it highly productive. He also said, that his wool brings three or four cents a pound in market more than Northern wool, because less "gummy."

Christian Observer.

Counsels to the Young.

Never be cast down by trifles. If a spider breaks his web twenty times, twenty times will he mend it again. Make up your minds to do a thing, and you will do it.—Fear not if trouble comes upon you; keep up your spirits though the day may be a dark one—

"Troubles never last forever,
The darkest day will pass away!"

If the sun is going down, look up to the stars; if the earth is dark, keep your eyes on heaven. With God's presence and God's promise, a man or child may be cheerful.

"Never despair when fog's in the air,
A sunshiny morning will come without warning!"

Mind what you run after! Never be content with a bubble that will burst; or a firewood that will end in smoke and darkness. But that which you cankeep, and which is worth keeping.

"Something startling that will stay
When gold and silver fly away!"

Fight hard against a hasty temper. Anger will come, but resist it strongly. A spark may set a house on fire. A fit of passion may give you cause to mourn all the days of your life. Never revenge an injury.

"He that revengeth knows no rest;
The meek possess a peaceful breast."

If you have an enemy, act kindly to him, and make him your friend. You may not win him over at once, but try again. Let one kindness be followed by another, till you have compassed your end. By little and by little great things are completed.

"Water falling day by day,
Wears the hardest rock away."

And so repeated kindness will soften a heart of stone.

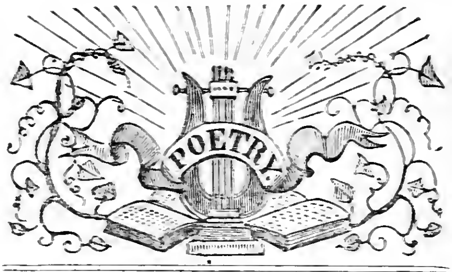
Whatever you do, do it willingly. A boy that is whipped at school never learns his lessons well. A boy that is compelled to work, cares not how badly it is performed. He that pulls off his coat cheerfully, strips up his clothes in earnest, and sings while he works, is the man for me—

"A cheerful spirit gets on quick;
A grumbler in the mud will stick."

Evil thoughts are worse enemies than lions and tigers, for we can get out of the way of wild beasts—but bad thoughts win their way everywhere. Keep your heads and hearts full of good thoughts, that bad thoughts may not find room—

"Be on your guard, and strive and pray,
To drive all evil thoughts away."

The rough work of the world is sure to be done sufficiently well at the prompting of those motives which impel every man to do the best he can for himself. These universal motives take effect alike upon the lad who sweeps a crossing and upon an under secretary of state. Another class of the common interests of a community will be cared for and made good by those who, while laboring, in fact, for their fellow-men, are thinking only of their individual tastes in doing so. It is thus that much of the intellectual work of a people is prosecuted in the fields of philosophy, poetry, and the fine arts.



The Light at Home.

The light at home! how bright it beams
When evening shades around us fall;
And from the lattice far it gleams
To lure to rest and comfort all.
When wearied with the toil of day;
And strife for glory, gold, or fame,
How sweet to seek the quiet way,
Where loving lips will lisp our name.

When, through the dark and stormy night,
The wayward wanderer homeward hies,
How cheering is the twinkling light,
Which through the forest gloom he spies!
It is the light of home, he feels
That loving hearts will greet him there,
And softly through his bosom steals
The joy and love that banish care.

The light at home! How still and sweet
It peeps from yonder cottage door—
The weary labourer to greet
When the rough toils of day are o'er!
Sad is the soul that does not know
The blessings that its beams impart,
The cheerful hopes and joys that flow,
And lighten up the heaviest heart.

From the Knickerbocker.

Rich Though Poor.

BY A. D. F. RANDOLPH.

No rood of land in all the earth,
No ships upon the sea,
Nor treasures rare, nor gems, nor gold,
Do any keep for me:
As yesterday I wrought for bread,
So must I toil to-day;
Yet some are not so rich as I,
Nor I so poor as they.

On yonder tree the sun-light falls,
The robin 's on the bough,
Still I can hear a merrier note
Than he is warbling now:
He's but an Arab of the sky,
And never lingers long:
But *that* o'erruns the livelong year
With music and with song.

Come, gather round me, little ones,
And as I sit me down,
With shouts of laughter on me place
A mimic regal crown:

Say, childless King, would I accept
Your armies and domain,
Or e'en your crown, and never feel
These tiny hands again?

There's more of honor in their touch
And blessing unto me,
Than kingdom unto kingdom joined,
Or navies on the sea:
So greater gifts to me are brought
Than Sheba's Queen did bring
To him, who at Jerusalem
Was *born* to be a King.

Look at my crown and then at yours
Look in my heart and thine:
How do our jewels now compare—
The earthly and divine?
Hold up your diamonds to the light,
Emerald and amethyst:
They're nothing to those love-lit eyes,
These lips so often kissed!

Oh! noblest Roman of them all,
That mother good and wise,
Who pointed to her little ones,
The jewels of her eyes.
Four sparkle in my own to-day,
Two deck a sinless brow:
How grow my riches at the thought
Of those in glory now!

And yet no rood of all the earth,
No ships upon the sea,
No treasures rare, nor gold, nor gems
Are safely kept for me:
Yet I am rich—myself a King?
And here is my domain:
Which only God shall take away
To give me back again!

Gentle Words.

A young rose in the summer time,
Is beautiful to me,
And glorious the many stars,
That glimmer on the sea:
But gentle words and loving hearts,
And hands to clasp my own,
Are better than the brightest flowers,
Or stars that ever shone;

The sun may warm the grass to life,
The dew, the drooping flowers,
And eyes grow bright and watch the light
Of autumn's opening hours:
But words that breathe of tenderness,
And smiles we know are true,
And warmer than the summer time,
And brighter than the dew.

It is not much the world can give,
With all its *subtile art*,
And gold or gems are not the things
To satisfy the heart:
But, O, if those who cluster round
The altar and the hearth,
Have gentle words and loving smiles,
How beautiful is earth!

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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For the Southern Planter.

Sorghum and other Substitutes for Blade Fodder.

MR. EDITOR:

In your December number I observe an article from a correspondent giving his experience in making molasses from Chinese Sugar Cane; and in a number preceding that by two or three months, I notice that another gentleman—I forget in what connection—expresses a willingness to give up fodder pulling, in case an equivalent can be suggested. I have some remarks to make on both these subjects, which I shall proceed to at once, suggesting to one gentleman what, with deference, I think a better purpose to which he may apply Chinese Sugar Cane, and to the other, several equivalents for blade fodder.

First. As to the manufacture of molasses from Chinese Sugar Cane. Admitting, argumentatively, that it will pay at the present prices, we have no guarantee of that price for any protracted period, and in the face of much competition, but rather good reason to expect a serious deduction: good enough at least to forbid the substitution of molasses for tobacco, which the comparison of your first named correspondent would insinuate. If it be possible to make it at the same profit that attends tobacco making, so many persons who do not make tobacco will make molasses that it will soon come down to the level of general prices, and will not be more profitable than other crops. But probably before that period will have been reached, the fall will have commenced in another and more influential quarter; to wit—the sugar countries. In them molasses is not a direct product, but a mere result or incident of the production of sugar. It is therefore almost of the nature of a spontaneous product, and is furnished, thus incidentally, in vast quantities. In British Guiana, which makes sugar for nine months of the year; in Cuba, which, I think, is engaged in the same process (of manufacturing sugar, not growing the cane,) for six months of the year; and in Louisiana, which, being able to devote only three months of the year to the same purpose, has found it necessary to invoke an import duty in aid of her competition with foreign countries; in all these it is evident that molasses, the mere drippings of their hogsheads, can be sold far more cheaply than by us, cultivating for the direct purpose, a plant whose aptness for that purpose is confined to a shorter period, at a time, which, with most farmers or cultivators of mixed crops, is otherwise fully occupied. Molasses is often sold in Havanna at

12½ cents the gallon, and sometimes, I think, much lower than that: freights and tariffs bring up the prices to what we have to pay But if we or the Yankees, (who, as I do not love them, I hope will try it,) shall attempt to raise our molasses at home, I think we shall soon see the effect of capital and skill when brought to bear on the cider mills and bacon pots which we array against them. Within the last twelve months I have seen that Maunsel White, of New Orleans, owns a sugar plantation worth about $800,000; Mr. Preston, of the same State, sold his plantation to another merchant of New Orleans for one million; the late Mr. H. Browse Trist left one which brought about $357,000; and two others belonging to his family connections brought, the one over $500,000, and the other over $300,000. From my own observation in that country, I incline to believe that the sugar plantations of Louisiana average over $100,000 in value—slaves, stock and all. Can we, with our diversified culture, compete at such odds in capital against climate, unsurpassed fertility of soil, and undivided attention to one staple? I think not. But still we can make something out of Chinese Sugar Cane. And this brings me:

Second. To remark upon the proposed substitutes for blade fodder. With their inveterate antipathy to change, which, with no matter how many exceptions, is the characteristic, and generally a wise one, of our farmers, too many of them eschew the practice of feeding work horses on green food. Hot weather, as the idea runs, requires dry food. I beg leave to express a different opinion. In Cuba, where it is "hot" enough, Indian corn grows very large and luxuriant stalks, but does not make a good ear. They grow it there as the common food of their horses, and it is fed to them green. The horses are quite small, but well formed and remarkably hardy. They ride there no other kind but stallions, whose only gait is a walk and a gallop. These stallions, I have been assured by Mr. Nicholas P. Trist, sometime Consul at Havanna, will take a heavy rider sixty miles a day in a gallop, without injury or undue fatigue. Now, as I learn by the same authority, they are fed mainly, if not entirely, on green corn-stalks and blades—a succession being cultivated for the purpose. The beautiful mules which draw their long-shafted and cumbrous *volantés*, a sort of double gig, the only pleasure vehicle of the country, worked by one horse, the driver mounted on his back, and three persons in the *volanté*, these mules, which our own people admire so much as of foreign growth, when in fact they are the pick of Kentucky and Tennessee, get scarcely any other food than the same green corn, and no other grooming than a daily swim in the waters of the harbour. But they keep fat.

So the horse of the Guacho of Buenos Ayres, ever on the gallop, traverses the vast Pampas, getting green clover for one hundred and eighty miles and green grass for four hundred and fifty miles more, and Heaven knows what for the remaining three hundred miles of bush. So the horses of California, (whether they *do* now or not, I cannot say,) did their work on the green grass of the plains until the proper season turned it to hay, in which state it lay until the rains of winter spoiled it. A very intelligent returned Californian, who kept a livery stable at one time in some of their cities, told me that his horses underwent much of their service on this fare: and on my asking him if our horses could stand it, said: "Oh, yes, as soon as they get used to it. The best horse in my stable was a blooded mare from the States: one that I took out over the plains from St. Louis." And how do any horses live on those plains except upon grass? What other food can our dragoons get? How can a Santa Fe trader obtain dry food? Who ever heard of that American Arab, or that modern Centaur,t he Camanche, raising food for *his* horse.

I have grouped these cases, Mr. Editor, which are stronger even than my position requires, to shew that the thing has been done systematically, and of necessity, and to engage attention by citing striking cases, rather than from any want of instances at home, which, simply because they *are* at home, may not be deemed so conclusive. I will state two of them. Last fall I was at the house of a friend in the Upper Country. His horses—four plough teams of three each—were just concluding a clover fallow, every foot of which had been broken up in the drought. They had cultivated in all other forms of horse work a large plantation—some twelve hundred acres; and they had eaten no corn, except a mid-day meal, of a few ears, from the first of May. Working "until you could see the stars," as my friend expressed it, they were then turned out into a good pasture to remain until day-break of the next day. Under this routine, continued until the first of October, when I saw them, they were fat, at least in fine working order. Others in the same section, under various modifications, pursued the same plan, and have done so for years. Indeed in some districts of Upper Virginia, this practice, though not universal, is yet so common, that some among them who may happen to read this article will be astonished that any one should think it necessary to recommend it or to vindicate it.

"But all people have not their good pastures," some objector will say. Very true: I am just coming to that with a bit of my own experience. A few years ago I happened to come into possession of a good grass farm—only there was no grass on it. Unlike Holkham, of which Coke said, that when he took it there was but one blade of grass on it, and two rabbits were fighting for that; there was nothing on it but water and wet clay, and the bull-frogs and crawfish were fighting for *that*. No grass there: Unless you dignify by that name the broom-straw and poverty-grass, which covered the ground, bearing to each other the same relation that the hair and the true fur do in a lady's sables, and interlaced with the creeping dew-berry. The first and second years I sowed rye and fed it green at the proper time to all my stock. The third year I managed to cut some clover, which I fed green, and I also got the privilege from an adjoining proprietor, of cutting partridge-pea on his low grounds; I fed all my stock a fortnight on that. But as my work was incessant and very hard, I fed corn along with it, but no long food except chaff and shucks at night, when fed at all. But in the season just passed I pursued a different plan; which was this: I work twelve mules. With that team, without an ox to help them, on a stiff clay farm, I manured fifty acres of land with straw and the ordinary farm manures; I hauled 4,660 bushels of lime an average haul of a mile and a half, up a steep hill, and over wretched roads, whereby I gutted the teams at the beginning of the working season. I worked 150 acres in corn, 50 in oats, and 50 in pea fallow; cut 160 acres of wheat with reapers, and threshed out 2,500 bushels of wheat with straw enough for 4,000 bushels; hauled the crop four miles to market, hauled also 800 bushels of corn the same distance, and hauled 3 miles, to mill and back, logs enough for a thousand yards of plank fence. This I call good work for the team. On the first of September my corn gave out, from whatever cause it may please the reader to assign, and then with a team jaded by their work, I had to get ready for my wheat crop. That comprised 175 acres of land: the pea fallow above spoken of, twenty-five acres of corn land, twenty acres of low grounds corn, and the balance clover and weed fallow, of which about twelve acres only had then been broken. Of course such land in such a season was baked very hard. I left home to stay a fortnight, with orders to my overseer to plough the land and feed the horses on refuse wheat ground up, on bran and brown stuff, with the addition of a plenty of cut oats—such oats as we all made last year on low grounds—as much seed in them as there were "reasons" in Gratiano's discourse, and very much of the same quality.

When I returned, much of the land had been ploughed with four horse teams, though it looked as rough as the sea in a cross wind; and to my utter astonishment the mules had picked up. Their hair, that most unmistakable indication, showed it at a glance. I thought it but just to congratulate my overseer and the ploughmen on the improvement, but gave some of the credit to the ground wheat. "They hav'nt had it," said the overseer, "the water has been so low that we have been glad to get meal for bread." "Then," I replied, "the brown stuff has been better this year than usual." "*That* did'nt do it, sir." "Then what did?" "That Chinese Sugar Cane. You had told me how they managed their horses in Cuba, and I thought I would try our mules in the same way. We had enough cane for the hogs, so I gave the mules a light feed or two of it. They seemed to relish it, so I gave them more. They have had nothing else to eat at night but that stuff thrown to them in the lot, and they always eat it up clean, seed and all; and they have been picking up ever since."—And so they continued to do until the Sorghum gave out. Then, the mill being still on a short allowance of water, they had to come back to bran, brown stuff and cut oats, and at once fell off. To shew the kind of work they did on this green food I will state one fact, and will begin at the top, so as not to tax the reader's credulity. I measured the largest clod I could find after a close search. It was 30 inches long, 20 inches wide, and 6 inches thick! I found others that I thought larger; but as it was more difficult to take the dimensions of their more irregular forms I did not measure them.*

Here then, to come to the point of this egotism, is a use that Sorghum may be put to. An experiment—made at this disadvantage: that it was tried on an exhausted team—kept up that team to very heavy work, and enabled me to get in my crop of wheat, which, without this and CROSSKILL'S CLOD CRUSHER, I am convinced I could not have done. Let it then be planted for this purpose, and let gentlemen who have no clover, many of them because they will not have, try enough of it for experiment's sake, only taking care to select the stalks whose saccharine principle is developed when they cut it. This is at first the main stalk, *not* the suckers, which generally do not ripen for a week or ten days afterwards.

Some persons perhaps may not be convinced by what I have said, and will insist on it that dry food is necessary. To such I will reply, not by argument but by offering them fit substitutes for fodder. I do not mean to say a word against good blade fodder *as* blade fodder. I admit its superior value for long forage, *provided* somebody gives it to you. But I make these points against it: that from the particular mode in which alone it can be gathered and cured, pulled by hand from each stalk, and cured by bundles, it costs about twice as much labour as it is worth; and that it robs the ear of a per centage of yield equal to its own value—thus costing two prices at once: that in many places it exposes the farm hands to the most unfavourable conditions for health—night work at a period of heavy dews, whereby the force of the farmer is frequently crippled for other and much more remunerating labours; and that it is subject to more risk in curing than any other long food we make. On one or more of these four counts I think I may ask a verdict against blade fodder if I can find an adequate substitute. Let us look for this substitute.

Why do we want long food at all? Because the stomach requires distention as well as nutrition. Its vital action depends on its mechanical condition. *Therefore* we want a belly full. If hay be given, then you have distension and nutrition in the same substance; but it is not necessary that this distending food should be nutritious, provided you give a food of more concentrated nutriment along with it. I know this practically, and by observation. For eighteen years, the period of my farming pursuits, I have never pulled fodder; and my teams have been in as good order as other people's, possibly better for the work they sometimes have to do. Their long food has been given to them green in the summer, with pasturage at night when I could get it: in the fall, winter, and early spring, corn-stalks—blades and all—shucks, wheat chaff, and cut oats,—(on which food, by the way, barring the oats, I have fattened many a bullock to the top of the market, feeding grain with it, of course.)—The corn stalks have been fed to them either in their stalls, or in an open lot when practicable, and in the first part of the winter. The other kinds have been variously fed as their appetites seemed to fluctuate. The chaff may be moistened and mixed with their grain or meal, or fed separately and dry. The shucks should always be cut up, except in cold weather, one feed in advance, moistened, sometimes with salt and water, then put into a wide shallow bin, and weighted down so as to diffuse the moisture through the mass. Every body says that cattle eat shucks with a little mould on them better than they do fresh ones. True: but not because they are mouldy; rather because they are moist. Let any one try it; chew a portion of sound dry shuck: you will find it sweetish, but tough as whit-leather. Soak it an hour or two in a glass of water, and try again: and so, as my Lord Coke says, "so note the diversity." The shuck which we handle necessarily a good deal, but not as much as we do blade fodder, and then throw away, almost, in muddy cow pens, is worth nearly as much as fodder. How much chaff is left rotting in piles? and yet good chaff, of clean strawed, healthy, beardless wheat, is worth as much as hay. Not that it contains upon analysis the same amount of food; but that in its thoroughly divided state—a state that the finest cut hay can never attain to—it offers its pabulum to the stomach in a form so much more accessible

*Of course I fed on green food until the clover began to salivate the horses, which was about or shortly after harvest. Then I fed shucks and new oats.

than hay, that it affords an equal available amount of nutriment. Here then as substitutes, are two articles of known efficiency; and one of them, the shucks, treated as I have suggested, is indispensable to the cotton-planter for his mules, and may be turned to an equally valuable use with us. I once got a friend to make the calculation for me, on a piece of low ground corn planted thickly, of the weight of shucks per acre; he made it 600 lbs. upon the data he obtained. Take half that quantity as correct for upland, and we have 30,000 pounds of shucks which, at 20 lbs daily to each of ten horses would give, on a hundred acres of land, enough long food to last them five months. The chaff would last them a greater or less period according to the relative quantity of wheat made.

I come now to my third substitute, which, like an amendment to an amendment, is a substitute for one of my substitutes. I speak of oats. The *policy* of making wheat after corn is a question I do not propose to discuss, nor the better policy of making wheat after oats—I know there are exceptional cases, but I do not speak of them. I assume for the present that wheat should not follow corn. Now, why do we cut up the stalks, whether we have previously gathered the fodder or not, and haul them, often a mile or more to the farm pen? Why? We do it that cattle may pick them, make water on them, dung on them, and give them fourfold weight of useless rain-water which mass, often a loblolly, we call manure; and that we may haul them, thus quadrupled in weight, an equally long distance in the spring and spread them on the land to dry. Now, let any man compute the more than five-fold labour of this process and see what it costs. "But we must have manure." Very well; have it, but don't pay so high for it. Haul your stalks from the low grounds, if you have them, for the benefit of the upland. But what stalks are on the upland leave there, blades and tops on them, and run your cows over them in all suitable weather during the winter. It will be better for the cows: they will get more food from them in this way than if thrown to them in a close pen; and the exercise will keep them in better order than if their systems are permitted to stagnate into lousiness under the best shelter. Then, in early spring, instead of hauling out the usual mixture, take the time it would cost you to do that—no more—and with a two or three-horse plough with a good, heavy chain running from the far end of the off swingle-tree to the top of the beam at the throat of the plough, bury the stalks and along with them the dung and urine your cattle have carried out for you as an incident. Having ploughed it, sow it in oats, and my word for it the *excess* of oats per acre thus made over what the usual plan gives will be worth more than that blade fodder from the same land which directly and indirectly costs four times its value to secure it. Then it will be a mere circumstance to fallow that oat stubble for wheat; it will bring you at least as much as the corn land would have done, and of a far better sample; and if it shall need manure, why instead of dung and urine and rain water, which you would have hauled out in the spring—a total haul back and forth at 12 loads per acre, of not less than 54,000 lbs. per acre—just apply by drill or broadcast one hundred pounds of genuine Peruvian Guano—the essence of dung and urine—and trust to Providence for the water. The difference in the saving of labour in hauling is as one hundred pounds to twenty-seven tons! the resulting product of wheat precisely the same; and the labour now appropriated to pulling fodder can be spent on tobacco, picking peas, ditching, shrubbing, anything you choose.

"But the cattle will trample the land in winter." Not to hurt it. Remember the story of Earl Fitzwilliam who compensated in advance his tenant, complaining that the Earl had ruined his wheat by fox-hunting over it in winter when it was wet; and how the honest farmer at harvest returned the money, saying he could see no difference between the trampled and untrampled land.

"But if this be so, which we doubt, we *must* have feed for our cattle in snows and rains and very muddy weather." Not to be stiff-necked, I admit it. Then try the Sorghum: cut it up at the root when ripe and cure it in shocks as you cure corn at a similar period. It will cure as well, they say, and retain its flavour unimpaired or slightly acidulated through the winter. I presume stock will eat it well, because I know they will eat a dried stalk of sugar cane, I having tried that recently. If that does not suit, make chaff and shucks and straw go as far as possible, feeding the horses on the excess of oats that the corn land will have yielded, and cut up as little corn as possible.

"But we cannot sow that much land in oats." Very well: add straw and stable manure and guano to a part of the land and make tobacco on it; or sow it in peas, as I do in part; or let it lie under the shade of the stalks and improve; or, if stiff land, plough it up in beds and let it take the sun: *that* process never yet injured stiff land.

"But admitting that you have, or think you have, fed successfully on such offal as you name, can you give another instance of similar successful practice?" I can; and a very remarkable one, which is as follows: several years ago, I knew very well a farmer, now dead, who lived on the edge of a town in Virginia. Though he was a farmer, a part of his business was to sell wood to the citizens of the town. His punctuality secured him as many customers as he wanted. He kept two six horse wagons, and twelve powerful horses. With these teams he hauled four miles over mountain roads a cord and a half of eight foot wood—seasoned oak and hickory—at a load, good measure; which was half a cord to the horse. His wagons were always going when his ploughs were not. Rarely did I ever see his horses at pasture except in harvest. He cut no hay, though he had a plenty of clover, because he rented the grazing of his pastures to the town people and sold milk and butter from his own cows, thus making with no labour more than the hay would have been worth. He pulled no fodder, because it paid him better to cut wood. Knowing this, and seeing that his horses, who often hauled 120 bushels of wheat six miles to a mill, were always fat, I asked his mode of managing them. He told me that he fed them liberally on meal, little or much according to their work, and on chaff or *wheat straw*, and nothing else, mixed up with the meal. His cornstalks and shucks *I think* he gave his cattle. In the summer his horses were turned out at night. Here then was the whole secret: meal, chaff and wheat straw kept those horses fat though they worked almost without intermission, and always under the strain of a full load. If *they* could do it, as they did for ten years to my knowledge, why cannot plantation horses with so many intervals of long rest do the same? And if they can, why pull fodder, even were it no worse than robbing Peter to pay Paul?

I have said nothing, Mr. Editor, about hay, because I wished to shew by "what has been done" and therefore "can be done again," that with or without Chinese Sugar Cane, and with or without the proposed plan of raising oats instead of wheat on the corn land, the ordinary offal of the farm, is sufficient to keep teams without using corn fodder. But I would by no means be understood as discouraging the making of hay. For farm horses clover hay is the best when well cured—and it is very easy to cure it well—and on all tobacco farms it interferes less with the culture of tobacco than any other hay plant, except orchard grass; it comes before harvest, and rarely treads on its heels, whereas all the rest come after harvest, when oats, wheat-threshing and worming tobacco demand all our time. But it is obvious that either clover on the one hand, or timothy and herdsgrass on the other, interfere less with tobacco than fodder does.

Never having pulled fodder, I cannot say of my own knowledge what amount can be gathered in a day; nor how much an acre will yield. But I have heard, it said that hands could not earn more than 75 cents per day at it. If this be true, and it be also true as John Taylor of Caroline said, that one moiety of the crop was lost on an average, it must be rather a small return for the investment. Years and years ago, when labour was cheap, negroes then selling at $300, one might have stood it. But now, at the present price of negroes, when the interest on his value, insurance or charge for replacement, taxes and maintenance will swell the actual cost of a good hand to 80 cents a day, and when his work must produce enough to cover the cost of the young, the aged and the idle, one cannot afford to employ him in work worth five cents less. Nor in any event, in view of the prices of other staples and of the increased value that the improvement of land gives to capital, can a farmer of the present day afford the expensive luxury of a fragrant bundle of "good old fodder."

This view of the question, the cost of our labour, is not often presented, and is rarely taken. If it were more studied, I believe a good many of our farm practices would be found alarmingly unproductive. At another time I may, perhaps, say something about that; but it is time this article were concluded.

I have not thought that what I have written would produce much effect on those who have been following the beaten track for years. But I hope that younger farmers, who have more recently entered the profession, with a smaller working force than was formerly deemed necessary, and the further difficulties of dearer lands and a more expensive, though less abundant style of living, may find herein matter for reflection, if not rules for practice.

STOVER.

For the Planter.

Tobacco Culture—Not Necessarily Exhausting or Demoralizing.

Mr. Editor,—A writer in the December number of the Planter, pitches into the cultivators of this important staple, with the declaration, that "it is the bane of Virginia Husbandry," and that it is the most "laborious, exhausting and demoralizing of all crops." Thus far, the 1st charge only in the indictment is made up, the writer having devoted a large space to a description of the labor incident to the preparation for the crop, in doing which, he has been compelled to admit, that the cultivators of this "demoralizing" weed, evince a degree of forethought, care and vigilance "unequalled in any other department of agriculture, in this or any other country." I propose to meet the objections he has urged, and will yet bring forward to the cultivation of this important crop, and shall prove that its culture is not, necessarily, either exhausting or demoralizing in its tendency. It may be premised that other, and far more distinguished opponents have assailed the cultivation of this crop. King James perpetrated some *twaddle* on the subject, which, to say the least of it, entitles him to no high rank among British classics, and Mr. Jefferson's strictures, founded upon the then prevailing and improper system of cultivation, has long misled public opinion at home and abroad on the subject. Besides such formidable opponents as a king, and a republican president, other and lesser men, seeking to arrest public attention, and to obtain a reputation for sagacity and philanthropy, by riding some easily ambling hobby, have entered the lists. They emulate the Eastern fig vender, crying aloud in the market place, "in the name of Allah, and the Holy Prophet—Figs!!" We pray for a deliverance from this class of reformers, who, having no capacity to initiate the great social reforms demanded by our age, and forgetting that ignorance, intemperance and vice, are every where to be met and fought, yet turn their batteries, charged with ignorance and prejudice upon great industrial interests, with which are identified men as moral and as progressive in agricultural improvement, as any in our State: That Tobacco is better adapted to those sections of Virginia, where its cultivation prevails, than any other crop, is the testimony of all who have examined the subject. It cannot be replaced by stock-raising, for our dry summers, and the absence of natural grasses, render the tobacco growing region, for the most part, unsuitable to this business: nor by corn, which except on alluvial lands, cannot be profitably grown as a sale crop; nor by wheat, with its countless enemies. It has paid the debts of Piedmont and the South Side Counties for a century, enabling the planter to leave his slaves to his children, instead of selling them to eke out the small income which, in the absence of this crop, would have been left him by the chinch bug and the joint worm. Speaking for this country, I can safely say, that but for the large income derived from this source, Peru, with her Guano, and *Ben Green*, with his two year old mules, would have reduced us to absolute bankruptcy. I shall now proceed to notice the charges of your correspondent in the order they occur. Thus far, his whole article is devoted to proving his first position, that it is the most laborious of all crops, a position which none will deny. *It is* the most engrossing and laborious of all crops, and yet with all this labor, *it pays*, which is what we want, and pays best of all our crops. What does a man, who has any proper idea of his duties, want? Is it not constant and remunerative labor for his people? The tobacco crop, which involves no great strain upon the physical energies of the laborer, furnishes employment in all weather, makes available the labor of women and young slaves, who would otherwise have to be sold, as being surplus hands, or maintained during the winter months in idleness. In its manufacture for purposes of commerce, thousands of slaves are employed, with a like exemption from exposure. It is a powerful conservator of the "peculiar institution" in Eastern Virginia. Abandon its culture, and one half of the slaves employed on tobacco farms, and *all* who are employed in its manufacture, will have to be dispensed with. Are its opponents in favor of any farther depletion of slavery from Eastern Virginia? Do they desire to see the manacles of the slave dealer on the hands of the thousands of intelligent factory operatives, whose labor adds so materially to the growth and prosperity of our cities? This will be one of the effects of its abandonment. There is then no force whatever in the objection that it is a crop requiring great labor. Constant attention, system and perseverance is all that is necessary in its culture, qualities to be encouraged under any system of husbandry. The character of the labor required is, at no time, under proper management, oppressive or greater than any other crop; it keeps our slaves in old Virginia, and what is better, *keeps them at work;* and finally, its cultivation yields a large annual profit, at a time when no other crop is ready for market.

As to the exhausting nature of this crop, the charge is not yet supported by your correspondent, nor can it be proved to be necessarily so. On the contrary, it is the most improving crop in our rotation. The consumption of timber is no object, where timber is very abundant; where there is a scarcity of it, plants for the crop, by the use of Guano alone, can be produced in abundance, and charcoal used in curing, instead of wood, which is an economy in fuel. Exhausting systems of cultivation every where prevail. Land may be impoverished by repeated cropping, without rest or grass, it matters not what staple is cultivated. Because it is sometimes the custom to cultivate tobacco year after year, on lots which absorb all the manure of the farm; it by no means follows that this is the only or the proper system. Indeed no one pursues this vandal system of cultivation, unless he be a renter of land, or a man whose mission it is to scar the bosom of mother earth, of which class there are many from tide-water to the Blue Ridge. It is the custom of all good planters to cultivate a mixed crop, under a proper rotation system, say that of four or five fields, of which one is in tobacco and corn, one in wheat after tobacco, (the best of all preparations for that crop,) and two or three in grass. Under such a rotation, with the aid of clover, plaster, peas and manure, which in regular order will be applied to every part of the farm, the land rapidly improves—tobacco performs a most important part in cleansing the land, and preparing it for wheat and grass. Let your correspondent visit Albemarle, Halifax, or any other county where this crop is *intelligently* and properly cultivated, and he will witness a degree of improvement and prosperity not exceeded by any part of the State. He will farther more learn, that the Sabbath day is not more desecrated by the planter than others, to avoid the contingency of frost, which when it comes, generally finds the crop of the industrious planter safely housed. Indeed so rarely does the necessity occur, to cut a crop on the Sabbath to save it from a threatened frost on the following Monday, that I know of no instance of its being done, except by men who habitually prefer to work 365 days in the year.

I am admonished by the length of this article, that I must defer until your correspondent again appears, all farther comments; but I propose a reply to any argument which aims to prove tobacco a demoralizer.

The writer of this article has tried both systems, tobacco as part of a system of mixed crops, and another system in which there was less labor, and greatly reduced receipts. He was induced many years ago, by the arguments and advice of a distinguished opponent of the weed in Virginia, to abandon its cultivation entirely. This gentleman cultivated a model farm, realizing a yield of wheat and corn, which if general, would leave no excuse for cultivating tobacco. But these results were accomplished by the aid of what Sydney Smith considered the most important requisite of good farming, viz. money, and this was provided by an adjunct to his Virginia farm, which the gentleman possessed down in Alabama, where they cultivate a crop as laborious and exhausting as tobacco. I persevered and gave his system a fair and honest trial, and found at the expiration of five or six years, that I had no Alabama adjunct to my Virginia estate, but that several of my slaves *had taken up their permanent residence in that State*, having been sold to meet deficiencies. I have returned to its cultivation, and connected therewith grass and the cereals. I assign it no such position as that of "the Idol God of the Plantation, before which your correspondent, getting eloquent and indignant, says every thing else is thrown down and trodden under foot." But I cultivate it, I chew it, I smoke it, and from all these operations derive great pleasure, and from the first the bulk of my farm income. McC.

Ditching and Manuring.

A friend in North Carolina has obligingly furnished us with a copy of the Transactions of the State Agricultural Society for 1857.

It contains the proceedings of the society at its annual meeting in October of that year; the annual address of J. L. Bridgers, Esq.; the premium essays, including several valuable ones on the subject of horizontal ploughing and hill-side ditching; and reports upon crops, &c., &c.

We shall recur to some of these essays in a future number, directing our attention for the present to the address of Mr. Bridgers. It is—what agricultural addresses should always be—of an eminently practical character, affording explicit and more or less full instruction on clearing, ditching and manuring; on fallow lands, and on cultivation, and closes with a few appropriate remarks on the science of agriculture.

We cite below a few extracts in relation to ditching and manuring.

DITCHING.

" An excess of water is hurtful in several ways: 1. It excludes the atmosphere; 2, it changes the mechanical condition of the soil; 3, it retards decomposition; 4, it renders the soil cold by evaporation; 5, the roots of many crops will not extend any deeper in the earth than the atmosphere penetrates, whilst other crops never mature if their roots reach the region of perpetual moisture; 6, it generates an acid or some other quality injurious to vegetable life.

" As to the first point, it is a self-evident proposition, that when the earth is filled with water the atmosphere is excluded, for the atmosphere fills up all space which would otherwise remain unoccupied. The roots of the growing crops ordinarily descend to the depth to which the atmosphere is freely admitted, and on most soils that is determined by the plow. This is clearly illustrated by observing the field after heavy rains, when it will be discovered that the length of the roots is governed by the depth to which the earth has been broken. This is especially noticeable in the very narrow space in which the point of the cast plow goes deepest, for this space is entirely filled with the roots of the crop. One great object of plowing is to admit the air into the soil; when the crop is clean and the soil has a slight crust, and is very soft beneath, I know of no other object for plowing.

" Secondly: It is almost purely a question of observation. Every planter has noticed hard bottoms become soft and friable by ditching; this is so generally known that it might be argued that all hard lands are owing to an excess of water. After having been thoroughly saturated for some time, portions of the earth are dissolved. and on drying become hard. So, while the water is present, the atmosphere is excluded, and as the water evaporates the closeness and hardness of the soil continue to exclude the atmosphere.

" Thirdly: It retards decomposition, and thereby renders the soil less capable of sustaining the growing crop. It is not known what length of time is required to decompose vegetable matter entirely submerged, for the atmosphere is the chief agent in decomposition, and every fact and argument that shows that an excess of water excludes the atmosphere from the soil, equally tends to show that it retards decomposition. In illustration of this, it is well known that the compost heap may be put up so wet that fermentation will not take place.

" Fourthly: It renders the soil colder by evaporation, and consequently the crop more backward. This may be well illustrated by placing a kettle of water over the fire for some minutes. The water is only slightly warm, if so at all, what has become of the heat applied to the kettle? It has been received by the water in a latent condition. In the spring of the year, while the heat of the sun would have been warming the soil, it is engaged in evaporating the excess of water. In our short seasons would it not be much better to drain the water off with the spade, for the surplusage must be disposed of by the sun or the spade, before the soil becomes fit for cultivation.

" Fifthly. There are some soils in which the roots of the crop seem to be limited in their downward tendency by atmospherical influence. In freshly cleared land, which is imperfectly drained, it may be observed that the roots of corn descend to a certain distance with great regularity; it will then be ascertained that they cease their downward tendancy at the point at which the water stood during the winter. And it may be announced as a proposition, so far as I know, universally true, that cotton never bears well when the tap root reaches the region of perpetual moisture, and this is one of the reasons why the cotton crop so often fails on swamp land. This is so often the case that in the opinion of many planters swamp land will not produce good cotton, but this is an assumption the contrary of which may be proved by experience.

"Sixthly. It is a well attested fact that some bottom lands which have been cleared, and also some which have not been cleared and poorly drained, will not produce a good crop the first year after draining. This is generally reputed to be owing to the acid condition of the soil. It is not so clear what is the cause, but there is no doubt of the fact. Sometimes such land fails entirely under a liberal application of manure. I have noticed an instance of a bottom which had been turned out for several years; it was ditched and planted in corn the same spring; from a gill to half a gallon of cotton seed was applied to the hill to note the effect of the different quantities. The crop, in a good season, was a failure, and two-thirds of the bottom did not manure a single ear; the second year the same land produced a fair crop, and the third year a much better one. Such facts are sufficient to convince the planter of the paramount importance of a thorough system of draining. Often the deleterious effects of imperfect draining are so slow and gradual as to escape observation, and the premature sterility of a once good soil is charged to the weakness of the ground instead of the ignorance of the planter.

MANURING.

"Here we approach the great question of manuring, for we cannot believe that the Creator intended that the earth should diminish in fertility by cultivation any more than that he designed that the human race should linger and perish away from its surface. We go farther: unless the earth can be increased in fertility whilst being cultivated, famine and pestilence are the final destiny of man, for there is a certain ratio between production and population. So we must conclude that the Creator has provided ample means for the support of the human family; for a while, man may devastate the fairest portion of creation, but sooner or later he must yield to the laws of nature, and discharge those higher duties which every citizen owes to posterity. To support himself and family he is compelled to restore to the earth that fertility which in his pride and ignorance he had wantonly destroyed.

"We have no means of computing the value of a proper system of manuring, whether as a source of national wealth or individual prosperity. It adds to the beauty of rural scenery, often restores health to the most sickly section by removing those causes which originate sickness; it substitutes activity for stagnation and plenty for want; it banishes sterility and clothes the barren field with waving corn. * * *

"The greatest difficulty is in obtaining the materials with which to manufacture manure, and the question, with an air of credulity, is often asked, how is it possible to manure from three to five hundred acres of land annually? Soil and sub-soil constitute the great and illimitable supplies for manuring. I have never seen a soil, except, perhaps, some very coarse and sandy ones, which would grow any vegetable matter, that would not constitute a valuable element in the compost heap. Whilst using many varieties of soil, white sand itself becomes a valuable ingredient; sub-soils are often worth more than old soil cultivated incessantly for years. Perhaps in the future, the sub-soil is to become the main supply. The surface of all uncultivated lands, and of land not too long cultivated, yields a fine supply, especially low or swamp lands. Sometimes it will be convenient to leave small branches and ponds in the field to haul their contents to the compost heap; the ditches are often deepened and widened with the same intention; the grasses which usually grow in ditches, are valuable for this purpose, especially on land long under cultivation. Every old field which produces broom-straw, especially when used with marl or ashes, by taking off the surface, makes a fine manure. This material, combined with some very sandy earth, yields the most remarkable result I have ever seen. Some old-fields of very limited fertility, when treated with this preparation, produce remarkable crops of cotton; sometimes this compost surpasses the river mud with this crop. Fallow land yields a much better material than the same land under the plow, besides being much lighter to haul. The effort has been made to use the same soil designed to be cultivated, but unless the land is new or lies fallow every other year, the heap soon fails. All soils and sub-soils which may be fermented, and all vegetable matter which may be decomposed are valuable for compost.

In preparing for composting, it is advisable, especially when the material is rough, to hoe or plough it sometime in advance, so that the atmosphere may be reducing it to a better condition. Rough soils and sub-soils, particularly those recently drained, are very much improved by freezing and thawing. Perhaps it would be of advantage to speak of the compost heap more particularly: the compost here spoken of, is put up in the field. For the convenience of hauling in the spring a heap is made in each acre, the material is thrown up with shovels as it is hauled in single horse carts; experience having shown that they are well adapted to hauling over cultivated land. The compost which is made in the summer is superior to that made in the winter. The heaps are broken up in the spring, and generally it is advisable to check the land so as to place the manure with more regularity; it is either placed in the drill or broad cast with the shovel. I shall consider the bulky material used as the mass of the heap and the other ingredients as stimulants or the decomposing elements. Haul together of the material designed to be used about one hundred and twenty-five loads, the load being five bushels. But if the coarse and apparently poor material is not made to undergo some change, the heap will be a failure; to accomplish this, we select some active ingredient which will produce fermentation, and thereby release the latent fertility of the material. In Edgecombe the agents generally used for this purpose are cotton seed, stable manure, marl, lime, ashes and any vegetable matter easily decomposed, as the rank weeds growing about the ditch banks, and from twenty to thirty bushels of cotton seed to the heap.

"In putting up the heap, place a layer of the material as thinly as possible, always remembering that the more thoroughly the soil and seed are intermixed, the more valuable will be the manure. If a supply of ashes or marl or any other alkaline substance can be procured, it will make a valuable addition; the ashes, from fifteen to twenty bushels, marl from twenty to thirty, are to be sprinkled over the cotton seed. Formerly, the seed and ashes were kept apart as much as practicable, but experience showed a better result when they were put together, for one great object of composting is to produce fermentation and decomposition, and the seed produce heat in proportion to the rapidity of their decomposition. Then let the mixture proceed as thoroughly as possible, until the heap is completed, with the top slightly rounding. The custom once obtained of putting up the heap in layers of seed and of earth without any effort to mix them, but this practice is now abandoned. When the seed are thrown up in layers, they are often black and mouldy, but if thoroughly mixed, it will be difficult to find a single seed when the heap is broken up. Whenever the seed appear in quantities, especially if partially stuck together, it is certain evidence that the heap has not passed through the proper change, for after fermentation and decomposition, the rough and hard material becomes soft and friable, and much lighter, and the seeds disappear.

"After the cotton seed, stable manure and vegetable matter are exhausted, the composition is continued with marl or ashes alone, from 25 to 30 bushels of decomposed or disintegrated marl, and 20 to 25 of ashes are the quantities ordinarily used. For cold and stiff soils twenty-five bushels of pure stable manure, with the same quantity of material, make a more valuable heap than a like quantity of cotton seed. Where the materials can be easily obtained, it would be better in diminished quantities to use them all in the same heap. Some swamp soils, after having been exposed for some time, thrown up and allowed to decompose, act very finely without any stimulating ingredient whatever. Whenever lime, marl, or ashes, or all together are used, it is advisable to add pine straw or any other vegetable matter which is easily decomposed, to the heap.

"We may secure a limited supply of vegetable matter of great fertility, by sowing peas thickly on the ditch bank, or other material to be used; the vines and roots not only supply a fertile ingredient, but they aid in the decomposition of the mass of the heap by some solvent power perhaps peculiar to the pea.

"It is necessary to note the fact, that some soils and sub-soils freshly thrown up, do not yield to this treatment, so safely and strongly are the latent elements of fertility locked up. In illustration of this fact, there are many ponds and swamps abounding in fertility, yet they will not produce a crop the first year after draining. Such soils and sub-soils are generally spoken of as acid, without knowing the actual cause; when the soil is in this condition, the cotton seed are not thoroughly decomposed; they have become black and the hull hard. If it was purely an acid soil, would it not yield its acid in combination with lime, marl or ashes?

yet such is not the fact. But when the same soil is exposed to the atmosphere, it becomes quite productive. May not this tend to show that the productive power of the earth is derived through the atmosphere? Should such unmanageable material be used in the beginning, it would have a strong tendency to confirm the belief that there is no peculiar advantage to be derived from composting.

"How such results are brought about by composting, is a question for the learned to decide, and the only light we can afford on this subject is merely conjectural. Most lands by incessant cultivation will lose their productive quality, but by being worked only every other year, they would remain in good heart for a long time. Many, after being reduced by unintermitted cropping, may be compared to an over-worked animal, but they are only rendered unfit for present use. If this is not so, why does a few years rest increase the fertility of worn out land so rapidly? It is well known that incessant cropping alters the mechanical texture of soils, and so soon as this condition is brought about, the land begins to become closer, and the process is continued until the atmosphere is first partially, and then entirely, excluded from the soil. Incessant cropping does more damage by excluding the atmosphere than by removing the particles of fertility. Hence, we conclude, that the great supply of fertility in the soil, is in a latent condition, that is, in one not fit for the growing crop. If this is not so, why does land produce for such a series of years when cultivated only every other year? We suppose that the fermentation which takes place in the compost heap developes or liberates the latent fertility in the soil and sub-soil used, and thus, artificially, is produced the same result in a short space of time which it would take the atmosphere alone several years to bring about. It is in this way, we suppose, that the heap receives its increase of active fertility. Upon trial, there will be found many valuable supplies for compost on most plantations, which are unnoticed in the beginning of the system. It is a great mistake to suppose that only rich and valuable soils and sub-soils are fit to be composted; experience soon proves to the contrary; there are many ditches cut more for the material for composting than for draining.

"Some of the most unlooked for results I have ever observed from composting, are from the use of a very sandy material; in many instances, it is advisable to add sand to the heap. Hence, it may be conjectured, that the fermentation produces some nitrate or silicate of potash which is known to be a very valuable fertilizer. We would suggest that the soft granite met with in many sections of the State, would be valuable, especially when pounded, to add to the compost heap to afford a supply of potash."

Evil Influence of the Bearing Rein.

[From practical facts and hints furnished in a series of papers to the *Edingburgh Veterinary Review*, by John George Dickinson, V. S., we select from Dadd's *Veterinary Journal*, the following on the bad effects, sometimes, resulting from the use of the bearing rein, as a subject of special interest to the horse owner, who desires to offer nothing but humane treatment to that noble animal.—EDITOR.]

The first case I have chosen is one showing the evil influence of the bearing rein.—A bay gelding, seven years old, the property of a carman, was brought to me, presenting the following symptoms: Flow of frothy saliva from the mouth, with peculiar spasmodic twitching of the muscles of the face and throat: there was difficulty of mastication and swallowing; the head was subject to violent jerks or twitches, attended with much pain, causing the animal to run back. The symptoms had appeared after the owner had thought fit to punish his horse with a severe bearing rein. I at once removed the cause, ordered hot fomentations and friction to the affected parts, exhibited stimulants, and all symptoms subsided, with the exception of a slight cough.

We have often been told that the practice of using the bearing rein, very frequently induces roaring in horses, but the results as observed in this horse, have not hitherto been noticed so far as I am aware. In communicating the facts to Mr. John Gamgee, of the Edinburgh New Veterinary College, however, I obtained a very satisfactory explanation. Mr. Gamgee considers the symptoms due to nervous derangement, from pressure indirectly exerted by the lower jaw on the jugular vein, the freedom of the circulation being also otherwise impeded from the uplifted position of the head, &c. Mr. Hunting, of South Hetton, has informed Mr. Gamgee that he believes megrims is due to pressure on the veins at the roots of the neck, by the collar, in peculiarly-formed horses, and he asks, "Who has known of a saddle horse affected with megrims?" Moreover, Mr. Hunting says, all horses subject to megrims may be permanently relieved, if worked with *pipe collars*. Dealers and others in some parts have learned that some horses have megrims when worked with the bearing rein or collar, whereas they are free from the disease if put to work with a simple breast-plate. As Mr. Gamgee says, we have here a more rational explanation of tight-reigning causing roaring than is usually given. It is true the old explanation is sometimes sufficient, that tight-reigning distorts the respiratory passages, and induces constriction of the trachea, &c., resulting in permanent interference with the breathing; but sometimes such mechanical interference is not the result of the use of the bearing rein, and we have the common lesion of the larynx or atrophy of its muscles. In these cases, according to Mr. John Gamgee, the superior laryngeal nerve has suffered through the repeated interference of the circulation of blood to the brain, and the early symptoms indicate general disturbance of important functions, such as those of the lungs and digestive organs, which are under the control of the pneumogastric nerve.

I beg to ask, if we find so much interference resulting from tight-reining, and confining the horse's head in an elevated position, on what principle can we defend the use of high racks? Our animals show their preference to a more natural method of picking their food by pulling the hay out of the lofty recess, and when on the ground they leisurely partake of it. This should never be lost sight of in the construction of stables.

Fattening Animals.

There are certain principles which apply to the feeding of all animals which we will shortly notice.

1. The breed is of great importance. A well bred animal not only affords less waste, but has the meat in the right places, the fibre is tender and juicy, and the fat is put on just where it is wanted. Compare the hind leg of a full-blood Durham ox, and a common one. The bone at the base of the tail extends much further in the former, affording more room for flesh, and the thigh swells out, of convex or circular shape; while in the common ox it falls in, dishing and hollow. Now the "round" is the most valuable cut, and is only found in perfection in high-b'red stock. The same is the case over the whole body. So well do eastern butchers understand this, that their prices are regulated by the breed, even where two animals are equally fat. They know that in a Durham or Hereford ox, not only will there be less offal in proportion to weight, but the greatest quantity of meat will be where it brings the highest price when retailed, and will be of a richer flavor, and more tender fibre. The same is the case with hogs. A large hog may chance to make more meat on a given quantity of food than a small one, but the meat of the first will be coarse and tasteless compared with the other; and in the east, flavor and tenderness greatly regulate prices. Consequently moderate sized, short-legged, small-headed hogs, always, in the long run, beat large breeds out of favor. In preparing for a market, "fashion and taste" must be as much considered by the farmer as by the tailor. This one fact is at present revolutionizing the English breed of sheep. The aristocracy always paid high for small Welch and Scotch mutton: but the great consumers, the mechanics, preferred large fat joints. The taste is now changed. In Manchester and other such cities, these large joints have become unsaleable; and all the efforts of the breeder are now turned towards small breeds maturing early, with comparatively little fat.—According to late writers, the large Leicester and Cotswold are going quite out of fashion. When we give $3,000 for a Durham bull, it is not that his progeny are "intrinsically" more valuable to that amount, but the increased value and the fashion together, make up the difference. And it is thus, that while Durhams and Herefords are preferred for ships and packing, Devons are high in repute for private families. The joints are smaller, but the meat has a peculiar richness, probably found in no other kind of stock; and the proportionate waste is said to be less than in any other breed. Thus in the London market, the Scotch Kyloes, and then the Devons, (the former even smaller than the latter,) bring the highest price, because preferred by the aristocracy. So in Dublin, spayed heifers are sought for. But the breed also regulates the profit.—There is nothing more certain than that one kind of animal will fatten to a given point on much less food than another, and as fat-

tening our stock is only another mode of selling our grain and grass, those animals are to be preferred which come to maturity soonest, and fatten on the least food. The difference in hogs is very great and important. While some breeds must be fed for two, or even three winters, others are full grown and fattened at ten months old; and the difference in profit is enormous. We cannot go into particulars, but the following rules may be considered as applying to all: An animal may be expected to fatten easily when it has fine, soft, elastic skin, with thin or silky hair; the head and legs short, the "barrel" large, but chest and lungs small (?); and when it is quiet, sleepy and easy in temper. An unquiet, restless, quick-tempered animal, is generally a bad feeder, and unprofitable.

2. Much depends in fattening, on outward and mechanical management. Fat is carbon, or the coal which supplies the body with heat. If we are exposed to cold, it is burnt up in our lungs as fast as it is deposited by the blood; but if we are kept warm, by shelter or clothing, it is deposited throughout the body, as a supply on hand when needed. Warm stables and pens are a great assistance in fattening, and should never be neglected. So, also, quiet and peacefulness are important. Every excited action consumes some part of the body which has to be supplied by the food, and detracts from the fat. In the climate of Michigan, warm stables, regular feeding at fixed hours, and kind treatment, with perfect cleanliness, save many a bushel of grain. Animals fed at irregular times are always uneasy and fretting.

3. Ground and cooked food fatten more profitably than raw food. Mr. Ellsworth found that hogs made as much flesh on one pound of corn ground and boiled to mush, as two pounds of raw unground corn; though the first did not fatten quite as readily, as they could not consume as much food in the twenty-four hours. By grinding and cooking, ten hogs will each gain 100 lbs. in weight, on the same food that five would do if it were raw.

4. A change of food helps in fattening. Thus an ox fed entirely on corn and hay, will not fatten as fast, or as well, as one which has roots, pumpkins, ground oats or buckwheat, &c., if fed to it at regular periods. The latter may contain intrinsically less nourishing matter than the corn, but the change produces some unknown effect on the stomach and system, that adds to the capability of depositing fat. The best feeders change the food very frequently, and find that they make a very decided profit by so doing. Salt should be given with every meal to cattle—say an ounce a day. It preserves the appetite and prevents torpor of the liver to which all fattening animals are subject. This torpor, or disease, is, to a certain extent, conducive to fat; but carried too far, the animal sinks under it.

5. In cattle the skin should be particularly attended to. A fat animal is in an unnatural state, and consequently subject to disease. Taking no exercise, it has not its usual power of throwing off poisons out of the system, and if the skin is foul, the whole labor is thrown on the kidneys. It is found by experience that oxen, regularly curried and cleaned daily, fatten better and faster than when left to themselves; and if the legs are pasted with dung, as is too often the case, it seriously injures the animal.

6. Too much rich food is injurious. The stomach can only assimilate a certain quantity at once. Thus an ox will prosper better on thirty pounds of corn and thirty lbs. of cob ground together daily, than on forty pounds of ground corn. These mixtures are also valuable and saving of cost for hogs when first put in the pen. If an animal loses its appetite, the food should at once be changed, and if possible, roots, pumpkins or steamed hay may be given.

7. Oxen will fatten better if the hay or stalks are cut for them, but care must be taken not to cut too short. An inch in length is about the right size for oxen, half or three-quarters of an inch for horses.—*Farmers' Com. and Horticultural Gazette.*

Is Tobacco an Exhausting Crop?

MESSRS. EDITORS.—In an article signed "L." and dated Dinwiddie, Jan. 27th, 1858, I find the following passage:

"Tobacco is of all crops the greatest exhauster." As I dissent utterly from this assertion, I beg leave to submit my views on the subject. I know that the opinion expressed by "L." is a very common one, and that it has led to very pernicious results in Virginia. I well remember that many years ago, I was directed by a resolution of an agricultural society, not a thousand miles from your city, to solicit a distinguished and talented gentleman—one of the first men, and, most successful farmers of the State—to favor the society with an address at its annual meeting. That gentlemen entertained the same opinion expressed by "L.," and declined to comply with my solicitation, on the ground that he could not make a speech on agricultural improvement without throwing discouragements in the way, as he did not think any improvement could be made, while tobacco was our staple crop; and to dispense with that crop was out of the question. My own observation and experience, being utterly at variance with such a view of the subject, I was induced to prepare an article, presenting, as I did and still believe, the reasons why it was that so many err on this subject. That article, so far as I know, has never been controverted.

But to the point. Is tobacco so great an exhauster? I say no: and for the best reason in the world, that any crop, succeeding tobacco, is universally superior to that succeeding any other hoe crop or fallow whatever. Wheat, oats, corn, and every thing, grows well after tobacco.

If "L." had imputed the exhaustion of the soil to the errors which tobacco planters generally commit, in their system of cultivation, instead of the tobacco, I might have concurred with him.

What has been the practice of our planters in time past? Aiming at large crops, they have applied all their manure to the tobacco fields or lots and followed the crop with wheat, and the wheat with tobacco, and so alternating every other year until the portion of land appropriated to these crops actually becomes sick of them. Whereas if clover had followed the wheat, and a new shift been selected every year, on which to make the crop of tobacco, and in this way a three or four shift rotation had been followed—to wit, tobacco, wheat, clover—very different results would have followed.

I could name planters who have pursued this system until they have manured nearly their entire farms. We all know, that land that has produced a fine crop of tobacco will produce fine wheat and fine clover; and that land that is made rich enough to produce these three crops in succession, may be kept rich enough to produce fine crops of tobacco *ad infinitum*.

We will suppose that a planter who cultivates 20 acres in tobacco, annually, will manure and clean that much annually, and that he will, after taking off the tobacco, put it in wheat and clover, and go on to manure the same quantity on another part of his land; until in four years he will have put 80 acres in good condition to produce fine crops. Having secured this much for his tobacco crops, he may then rely on the clover to keep his land in good heart, and may go on adding 20 acres of land annually to his manured surface for corn. We will suppose that having thus secured a regular four year rotation for tobacco, and adding 20 acres annually for corn, his facilities and resources for increasing the manured surface are rapidly adding to the productive capacity of his farm. In fact, every improved acre gives additional means of improving every other acre, until finally, if this system was adhered to by our planters generally, we would soon hear no more of the exhausting effects of the tobacco culture.

We verily believe that this mistaken notion, that tobacco is an exhausting crop, has done as much, if not more, to depopulate Virginia than any other agency. I am anxious to see such notions give place to enlightened, practical experiments.

We had some experience in the practice of the system which we recommend in our youthful days, and therefore speak with confidence of its efficacy. We took an old dilapidated farm. We commenced on a small scale to enrich our tobacco lots, put them in wheat and clover, and occasionally cleared some land to make out our crops. In a few years we had risen, by this system, from crops of 10 to 18 or 20 hds. of tobacco annually. Had we pursued it on the same farm, up to this time, there is no telling to what extent our improvements would have reached.

We recommend to "L." to try this system. It can do him no harm, and may perhaps benefit him very much. If he makes his land rich enough to produce fine tobacco, it will produce fine wheat and fine clover. If it produces good crops of clover once in three years, he need not fear but that it will produce also good crops of tobacco every third year; and if he will add occasionally a bushel of plaster to the acre on clover, he need entertain no fear that it will ever get poor; but on the contrary, may rest satisfied that it will continue in good heart, if it does not improve.

It is by no means uncommon for farmers to look any where, for reasons for the decline of their land. but to their own mismanagement. We are too apt to blame the seasons. or the soil, for our failures to make good crops when perhaps if we could scrutinize our own doings, we might come to very different conclusions. Let us then make the best use of our means. Let us bestow on our old mother earth some returns for the bounties she is continually pouring into our garners. Let us not impute our ill success to the crops we cultivate, but to our injudicious waste of labor in running over too much surface. Let us not be ever looking west for graves, but let us cleave to the good Old Diminion, and make our graves beside those of our fathers.

The cultivation of tobacco is not necessarily pernicious to our soil. Pursued wisely, it is indeed an ameliorating crop. It is a cleansing crop. Do you want a good meadow? Put it first in tobacco. Do you want a beautiful lawn around your dwelling? put it in tobacco, then in grass. Make your land rich enough to produce a fine crop of tobacco, and it will repay in any other succeeding crop, whether it be corn, wheat, oats, grass, or any other crop.—*Southern Farmer.*

Currency Terms.

The origin of the word sterling has been explained as follows in a correspondence of the *Transcript* :—

"Your correspondent refers to the pound *sterling* or *easterling*, which word, I believe, is commonly spelled *esterling*. Some of your readers may not be aware of the origin of the word *sterling*, about which antiquarians have doubted. The word *esterlings* may be found in Spelman's glossary. The word was first applied to English pennies, in the reign of Edward I., about the year 1279. Henry, in his History of G. B., vol. vi., page 297, London. 1814. says—'In the course of this period, the silver penny is sometimes called an *esterling* or sterling; and good money in general is sometimes called *esterling* or *sterling* money.' It is unnecessary to mention the various conjectures of antiquaries about the origin and meaning of this appellation. The most probable meaning seems to be this:—that some artists from Germany who were called esterlings from the situation of their country, had been employed in fabricating our money, which consisted chiefly of silver pennies, and that from them the penny was called an *esterling*, and our money *esterling* or *sterling* money.

"I used to be puzzled to know why a certain coin was called a *milled* dollar.—Antoine Brucher, a Frenchman, invented the '*mill*' for making money, and money was first struck with it, in 1553. It was brought into England by Philip Mestzel, and Elizabeth had *milled* money struck in 1562. It was used in France, till 1585, and in England, till 1572, but gave place to the cheaper expedient of the *hammer;* which, in 1617, gave place to the engine of Belancier; which was merged in the great improvements of Boulton and Watt, at Soho, in 1788. In 1811, the art was brought to very great perfection, at the mint in London. One of the most interesting objects, at the present day, in Philadelphia, is the whole process of coinage, from first to last, from the crude California snuff, as it enters the melting pot, till it verifies the proverb and taketh the wings of an *eagle* and flieth away."

The dollar mark ($) is derived from the use of the old Spanish pillar dollar, which was of very general circulation and known value. the two pillars enclosed with an S became the cypher for Spanish dollar.

Hunt's Merchant's Magazine.

A Note worth Knowing about Peach Soils.

Rivers, the well known fruit culturist, observes in the latest edition of his catalogue, that having noticed that his peach and nectarine trees did best where planted close to a pathway where the soil was well trodden down, he has found that the best preparation for peaches and nectarines, is to give a poor and exhausted soil a good dressing of rotten dung and clayey loam, equal parts, dug in two feet deep. When the trees are planted, which should be in spring, the ground all over its surface should be thoroughly rammed down with a wooden paving rammer. After this a dressing of compost about an inch or two in thickness may be added. The ground should be kept clean. but not stirred during the summer. After the ground is once rammed, it should not be cropped or stirred in any way except to keep it clean. And every spring the ramming should be repeated, and the top dressing added. But neither spade, nor shovel should be permitted to disturb the soil—*Prairie Farmer.*

From Russel's Magazine.

Notes on the Pine Trees of Lower Virginia and North Carolina.

By Edmund Ruffin.

Pines made a large proportion of the trees of the primitive forests of the eastern and lower lands of Virginia and North Carolina. And when any of these lands had been cleared and cultivated, exhausted and abandoned, then a new growth of pines formed the universal unmixed cover. As nearly all the lands of lower Virginia had had been thus treated, and in succession had reached this second growth, which thus covered all the then poorest and most worthless lands, a general cover of pines, and the term "pine old-fields," came to be generally understood as indicative of the poorest and meanest of lands. For this reason, and also because of the growth of pines being so common and pervading, these trees were not only undervalued, but despised. If a natural forest of various trees was thinned out to make an ornamental grove near a mansion, every noble pine would be certainly cut out, as if a deformity, and a worthless cumberer of the ground. In planting trees for the embellishment of homesteads, if any proprietor had in part selected any of our native pines for that purpose, his taste would have been deemed as ridiculous as it was novel and strange. For the most magnificent pines, or the unmixed evergreen of a pine forest in winter, to be admired, it was requisite that the observer should be a stranger, from some distant region, in which pine trees and pine forests were not known. Then, indeed, and in all such cases, their remarkable beauty and grandeur would be fully felt and acknowledged.

All of the many species of pines have the properties of being resinous, and bearing their seeds in cones; which, however varying in size and form have a close general resemblance. And there is a like general similarity of shape, differing from all other trees, of their peculiar evergreen leaves. These spring from seaths, or are held in clusters of two, three or more leaves to each sheath, according to the species of the tree. The leaves, differing from all others, except of the kindred family of the larch, are long and slender, almost as thick as their width, and of equal diameter throughout their length, except immediately at the extremity, which is a sharp point. The new leaves as on other trees, grow only on the new twigs (or 'water-sprouts') which shoot out in the spring, from the last year's buds. But the leaves of the preceding year's growth remain attached to the older branches through a second summer, if not the autumn also. In some species the leaves sometimes in part remain into the third year before dropping off entirely.

Some of our species of pines are of such distinct and marked appearance, that the most careless observer would not fail to distingush them. Such are the Southern long-leaf pine, (*pinus australis,*) the Jersey pine (*p. inops,*) and the white pine, (*p. strobus.*) But many farmers who have long lived on cultivated lands, among pines, have not learned always to distinguish other still more common species. And even when this knowledge is not wanting, still there is such confusion and misapplication of the vulgar names of all the kinds, that it is difficult for any one to speak of or to inquire concerning any one pine, by the vulgar name of his own neighborhood, without the name being misapplied by an auditor from another locality. Thus, the name "yellow pine," in different places is used for three different species, of all of which the heartwood is more or less yellowish. The name "spruce pine" is used in Virginia for one species of pine, and farther south for another. And the several designations of "long-leaf pine," "short-leaf," "old-field pine," &c., are merely terms relative, or used in contrast with other different growths, and are each applied to different kinds in different places. Even the botanical names, though serving generally for exact designation, in most cases have either no special application, or are entirely erroneous as to their meanings. Such are the designations "*mitis,*" "*inops,*" and especially "*palustris,*" as descriptive terms of species. Further, the qualities and value for timber, and even appearance of pines of the same species, are so much varied by different conditions of situation and growth, that some of the most experienced and intelligent "timber-getters" (or "lumberers") consider as two distinct species, trees which belong to the same. I have, myself, until recently, been under some of these mistakes as to the species with which I had longest been familiar. Under such circumstances I cannot even now be confident of avoiding errors. But even my mistakes, (if corrected by others better informed) as well as my correct descriptions and designations, may serve to clear away much of the obscurity and error in which this subject has been involved.

One of the most remakable and valuable qualities of some of the pines is, that their winged seeds are distributed by winds to great distances, and in great numbers, so that every abandoned field is speedily and thickly seeded, and the kind of pine which is most favored by the soil and situation, in a few years covers the ground with its young plants. The growth, especially of the most common second-growth pine, (*p. tæda,*) is astonishingly rapid, and even on the poorest land. And while other land might still be bare of trees, that which favors this growth would be again under a new and heavy, though young, growth of pines. This offers, (especially in connection with the use of calcareous manures,) the most cheap, rapid and effectual means for great improvement of poor soils. And besides this greatest end the cover of the more mature wood, if marketable for fuel, will offer the quickest and greatest return of crop that could have been obtained from such poor and exhausted land.

I will now proceed to remark on each of the several species of pines found anywhere in the region in view, and will commence with such as are most easily and certainly to be distinguished, before treating of those less distinguishable, or in regard to which there may yet remain any doubt or uncertainty.

1. *The Long-Leaf or Southern Pine.* (*Pinus Australis* of Michaux, *Palustris*, of Linnæus.)—The name *palustris*, notwithstanding its high authority, is altogether inappropriate, as this pine prefers dry soil and is rarely seen, and never in perfection, on wet or even slightly moist ground. *Australis* is peculiarly appropriate, as this tree is limited to a Southern climate.

This species barely extends a few miles north of the southern boundary of Virginia, in the south-eastern counties of Southampton and Nansemond. Few, if any, stand in the lower and wetter lands of the more eastern counties in the same southern range. The long-leaf pine prefers dry and sandy soils, and is found, almost without interruption, says Michaux, "in the lower Carolinas, Georgia and Florida, over a tract of more than six hundred miles, from N. E. to S. W. and more than one hundred miles broad;" but not, (as that author also says), from the sea to the mountains, or near to either, in North Carolina. In that state it extends westward not much higher than the falls of the rivers, and towards the sea, no farther than the edge of the broad border of low, flat and moist land. Its general and best growth also equally indicates a sterile soil. The mean size, sixty to seventy feet high, with a nearly uniform diameter of fifteen to eigteen inches for two-thirds of the height. Some trees are much larger and taller. Leaves ten to twelve inches long, (fourteen and more on some young trees,*) growing in threes, (to each sheath,) and about 1-16th to 1-13th of an inch in breadth. The cones from 7 to 8 inches long, and 2 to 2½ broad before the opening of the scales or seed-covers, or four inches when spread open. The seed-covers of the cones are armed with short, strong and not very sharp spurs. The seeds, when stripped of their shells, are white and larger than a common grain of wheat, and are of agreeable taste, though having a resinous flavor. They are so eagerly sought for by hogs, that scarcely any are left on the ground to germinate. For this cause, as well as the great destruction of the trees in tapping them for turpentine, these pines are rapidly diminishing in number, and, if not protected, this noble species will almost disappear from the great region which it has heretofore almost exclusively covered and adorned. This tree is especially resinous, and is the only pine that is tapped for turpentine. Scarcely a good tree in North Carolina has escaped this operation, unless in some few tracts of land where that business has not yet been begun. This tree also has furnished the best of pine lumber; but its durability is said to be much lessened by the tree, when living, having been made to yield turpentine. The heart is large and the grain of this timber is close, and only inferior in that respect to the short leaf yellow pine, (*p. mitis* or *variabilis.*) For naval architecture, timber of this tree, when large enough for the purposes required, is preferred to that of all other pines.

The broad belt of land stretching through North Carolina, which has been covered by the long-leaf pine, except for the borders of rivers, is generally level, sandy and nat-

* I have since found and measured leaves 19½ inches long, in Barnwell, S. C.

urally poor. Even if it had been much richer and better for agricultural profits, the labors of agriculture would still have been neglected in the generally preferred pursuit of the turpentine harvest. But so poor were the lands and so great the profits of labor, and even of the land, in the turpentine business, compared to other available products, that capital thus invested has generally yielded more profit than agriculture on the richest lands. Therefore, it is neither strange nor censurable, but altogether judicious, while these great profits were to be obtained, that nearly all the labor of this region was devoted to making turpentine, instead of enriching and cultivating the soil. But the effect of the course pursued has been not only to limit agricultural labors to the narrowest bounds, (as was proper,) but also to prevent almost every effort for improving the soil and the productions of the small extent of land under tillage. However, the juncture is now reached when this formerly most profitable turpentine business must be gradually lost; and then agriculture and improvement of fertility will not only be attended to, but will be especially rewarded in many portions of this now poor region, which yet possesses great resources for being fertilized. The rapid destruction of the forests of long-leaf pine is not only the necessary result of the two causes before stated, but the work has been still, more rapidly forwarded in some places, by another cause. At one time, in years past there was a sudden and wide-spread disease of this kind of pine, caused by the attack of some insect unknown before or since. Fortunately the operation, though far extended, was not general. But wherever it was, the destruction of the living trees was nearly or quite complete. For thousands of acres of pine forest together, and in a single summer, every tree was killed. The evidences of such destruction in the still standing dead trunks, are now seen in many places, and most extensively, as I lately saw, along the route of the Wilmington and Manchester Railway, not many miles south of the Cape Fear river. Similar extensive, and as transient destructive visitations, had occurred long before. One of these I remember to have read of forty years ago, in a communication to the Memoirs of the Philadelphia Agricultural Society. Partial as these depredations have been, as to species, any one proprietor, or many adjacent proprietors, in the route of these ravages, might have the whole value of their pine forests utterly destroyed in a few weeks.

The great beauty and striking appearance (to a stranger) of a southern pine tree, of great size and fine form, are owing to the long and straight and slender trunk, and to the very long leaves and large cones. In the close growth of forests, the branches, like other old and good timber pines of other species, are crooked, irregular, rigid and unsightly. But these and all defects are overlooked in their forest growth, when all the numerous trees make but one great and magnificent object, their tops meeting to make one great and thick canopy of green, supported, as far as the sight can stretch, over the open space below, by innumerable tall columns of the long and straight and naked bodies of the pines.

The Cedar Pine. (*Pinus inops.*)—This pine, like some others, has sundry names and some of which are also applied elsewhere to other species. In Virginia it is known in different places as the "spruce" or "river" or "cedar pine." The last vulgar designation, which will be here used, has been applied because of a slight general resemblance of the growth and appearance of the tree to the cedar; at least more so than of any other pine; and so far the name is descriptive and appropriate. The most general vulgar name farther north is "Jersey pine," which is adopted by Michaux.

This pine is generally seen only of young growth and small sizes. Where long established, and of largest sizes, in Virginia, it is rarely found exceeding fifteen inches in diameter. The trunk is not often straight enough for sawing into timber. The bark is very thin, and also smooth compared to all other pines of this region, and the sap-wood also is very thin .Of the older trees, nearly all the trunk is of heart-wood. Though the tree is but moderately supplied with resin, it makes good fuel, and much better than other pines of Virginia, of the new growth and but moderate sizes, such as are mostly used for fuel, for market, and especially for the furnaces of steam engines. The leaves of this pine grow in twos, (from each sheath,) are generally shorter than any other kind, usually from one and a-half to two inches, and about one-twentieth to one-sixteenth broad. The cones usually are from one and three-fourths to two and one-fourth inches long, and three-fourths to one inch thick, when closed. The separate seed-covers on the cones have each a small and sharp prickle, curved backward. The cones are set drooping backward on the branches; and they reman so long before falling, that the old and the new together sometimes stand on a tree as thick as the fruit on an apple tree. The branches are much more slender, tapering, and flexible than of other pines, and the general figures and outlines of the well-grown trees are more graceful and beautiful. When making the entire growth of a thick wood, and on the slope of a hill-side, where the tops of the higher trees are seen above the trees next below, and all thus best exposed to view, the foliage and the whole growth, so disposed, are singularly beautiful.

I have not observed this tree anywhere in North Carolina. It is but sparsely set and mostly of young growth in the south-eastern parts of Virginia. But the growth is there increasing and spreading. In Prince George, on and near James River, the young trees are far more numerous, and more widely scattered now than was the case forty years ago, when I knew them there only on some spots near the river banks. On the lower Appomattox, in that county, this is now the principal pine growth, and of its large sizes. In Westmoreland, and the other parts of of the peninsula, between the lower Potomac and Rappahannock, this is now the main growth, and the great supply for market fuel, which is so great a product and labor of that region. Yet I have heard, from Mr. Willoughby Newton, that it is remembered when not a tree of this species was to be seen in all the extent of that peninsula. It is now there the regular second-growth pine, which first springs on and occupies all abandoned fields, as do the other "old-field" pines, of different species, in other parts of Virginia and North Carolina.

The White Pine. (*Pinus strobus.*)—This tree, of beautiful foliage and general appearance, and which grows to a magnificent height, is not known in eastern North Carolina, and is so rarely seen anywhere in Virginia east of the mountains, that it scarcely comes within the limits of my designed subject for remark. However, it is named for the contrast it presents, and thereby setting off more strongly the opposite qualities of other species. But its description need not occupy more than a small space. This is the great timber pine of the northern States. In travelling westward from the sea coast through the middle of Virginia, this tree is first seen in the narrow valleys of the North Mountains in Augusta county. It is there called the silver pine. The small trees are beautiful and the large ones magnificent. The bark of the young trees is very smooth, (in this differing from all other pines,) and the branches spring from and surround the young stems in regular succession, and three or four from the same height, on opposite sides, as do the young side-shoots of dogwood. The leaves grow in fives, (from each sheath,) about four inches long, and very slender and delicate, and of a bluish green color, and silken gloss.

This pine, different from all of the other species growing in our region, prefers such fine soils as are found on the alluvial but dry margins of rivers, and in mountain glens.—[*Darlington's Agricultural Botany.*]

Short Leaf or Yellow Pine. (*Pinus variabilis.. P. mitis of Michaux.*) Cones, length $1\frac{3}{4}$ to 2 inches. Breadth, (as closed,) $\frac{3}{4}$ to $\frac{7}{8}$. Nearly smooth, the prickles being very short, slender, and weak. Leaves, length, on different trees, $1\frac{3}{4}$ to 3 inches; breadth, 1-24 to 1-20. The leaves grow mostly in twos (from each sheath,) and many trees, if but slightly examined, might seem to show that this was the universal law of this pine. But on most trees there are also leaves, in much smaller numbers, growing in threes, intermixed with the others. This variation is especially apt to occur, partially, on very young trees, of rapid growth. On one tree, of eight inches diameter, cut down to furnish specimens of cones, I found so many of the leaves in threes, that those in twos did not amount to one in twenty. The leaves in threes being in greater number, I have not observed elsewhere. Generally, the leaves in twos on any one tree, are very far the most numerous. All the specimens, from which the measurements were made, I gathered in the old forest-land of Marlbourn farm, Hanover, Va. The lengths of leaves on different trees vary much, and in some cases, even on the same tree and twig,—and also the sizes of cones on different trees,—as well as the proportions of leaves in twos and threes. From these marked variations, I am disposed to believe that some trees are of hybrid generation, or crosses between the pure short-leaved tree of the species, and the *p tæda.* But whether this surmise is correct or not, and however great and many may be the variations, this species, notwithstanding its variations, is easily distinguished by its short leaves in twos, from any of the three-leaved species—and it cannot be mistaken for the cedar pine, (*p. inops.*) the only other short and two-leaved species, because of the great difference of general appearance. The short-leaf yellow pine, (*p. variabilis,*) in middle and most of lower Virginia, is the great and valuable timber pine of that region, and makes the best timber of all, because of its more resinous heart-wood and very close grain. The most beautiful and highly valued floors of lower Virginia, and which are no where equalled, are made of plank of this tree. Old trees, in original forests, are from two to three feet in diameter, and usually are mostly of heart-wood. This is very durable. But the sap-wood, if exposed to changes of moisture, soon rots, as with all other pines. Formerly, nearly all the pines of the original forests in lower Virginia, and in dry and medium or stiff soils were of this kind. But as these and other trees have been cut out, and the forests thinned, other kinds, (mostly *p. tæda,* and in fewer cases, *p. inops,*) have made most of the later growth. And still more, and almost entirely, is this the case on abandoned old fields, whereon, though speedily covered by pines, very few of this species are to be seen. Yet in the upper country, at some distance above the falls, (as in Cumberland, Amelia, &c.,) though the abandoned fields are there also occupied by a second growth exclusively of pines, yet all these are of this kind, and scarcely a tree is seen of the *p. tæda,* or the "oldfield" pine of the lower country generally. The same thing I have seen in Orange, N. C., on abandoned high land fields, near the head affluents of Neuse river.

When of recent and rapid growth, and especially when of second growth on land formerly cleared, this pine is mostly of sap-wood, in that respect like the *p. tæda;* but still the former has more heart, and is of more durability, when exposed to the weather than the latter.

The yellow pine grows, (or formerly grew,) in great perfection, but in detached and scattered and limited localities, in sundry of the upper counties east of the mountains in Virginia. But, generally, in the Piedmont region, at fifty miles and farther above the falls, neither this nor any other pine grew in the original forests. In the range of counties next below the falls, it was formerly almost the only pine, and also the most common of all trees, of the original forest growth. It lessens in quantity, or in proportion to other species, as we descend towards the sea coast, and also as we go southward. After reaching the low, flat lands near the sea coast, and the southern region where the long leaf pine first appears, the yellow pine is seen but rarely. But as far south and east as Pitt County, N. C., at one place, and in Beaufort County, near Washington, I saw that nearly all the forest pines, on some spaces, were of this species, and of large size and fine form. The spots on which they thus show, are of dry soil, and, probably, also more clayey than in general, so as to favor more the growth of this than of the long-leaf pine. Also, between Plymouth and the great swamp in Washington County, N. C., this pine, of large size, and very perfect form, and with long and straight trunks, is the main original forest growth, on level, stiff soil, which, though firm land, and called dry, is so low and moist that I was surprised to find thereon this kind of pine. These facts, and especially the last case, go to show that a close or clayey soil, or subsoil, has more power to promote the growth of this pine, than it is opposed by the increased approach to southern climate, and low and damp soil, both of which are unfavorable to this pine, and very favorable respectively, to other species. This pine is also seen, in few cases and of bad growth, in the always wet and miry, and often overflowed, swamps bordering on Blackwater River in Virginia, south of the Seaboard Railway.

Loblolly Pine. (*Pinus tæda.*) This is called "long-leaf" in the Piedmont counties of Virginia, where the "short-leaf" is common and this is rare—and "oldfield" pine in most of the lower counties, where that designation is correctly descriptive. But as both these provincial names are elsewhere applied to other pines, I prefer the vulgar name used in South Carolina, of "loblolly," which, though unmeaning, will not mislead by having more than this one application.

The loblolly pine (*p. tæda*) is rarely seen north of Washington, D. C. I saw a few on exhausted land near Bladensburg, Md., within a few miles of Washington. Proceeding southward they become more and more abundant, but do not extend westward many miles above the line of the falls of the rivers. I shall again refer to this supposed western limit of its growth, and the supposed cause of this boundary. On all the exhausted and abandoned naturally poor soils, both dry and moist, certainly, and much, also, of the naturally, good, but exhausted, south and east of this upper limit, the loblolly pine springs soon and speedily, and thickly covers the surface. With some exceptions already named, where the cedar pine is the common second growth, the loblolly pines make the almost entire, and also abundant, second growth, on these abandoned lands. In the original forests, probably, it was formerly rather a scarce tree, as it is still, where there has been not much cutting out and thinning of the natural forest. It is only as a second growth that this pine has become abundant, and only on all the poorest and worst natural soils that it has taken almost entire possession of the ground, and seems to exclude other trees, and to thrive in proportion to the base quality of the soil—and more especially in proportion to the deficiency of lime in the soil. But, also, sandy soil and warm climate are further promotive of this growth; and, therefore, as proceeding southward, through eastern North Carolina, the loblolly pine, as a second growth, thrives more and more in general. I have even seen some few large and flourishing pines of this species, on the Rocky Point land, which seemed to be certainly calcareous.

As it is a disputed question, which will be considered hereafter, whether the great Swamp or Slash Pine, a valuable tree for lumber, is of the same species, or different from this, for the present I will speak only of all such trees as are undoubtedly of the kind known as "loblolly," pines.

These make the general, and in many places the exclusive, second growth from some ten or twenty miles above the lower granite falls, to the sea coast. Within these extreme limits, almost every exhausted and abandoned space is soon covered by this growth, whether naturally poor or rich, of medium texture, or sandy, wet or dry. The only known exceptions are spots of old, cleared lands, which, from some cause, were highly calcareous, on which the loblolly pine refuses to grow; or if growing, shows plainly an unhealthy and unthrifty growth.

The cones on different trees are from 3 to 5 inches long, and from 1 to 1⅝ inches thick, (as closed.) The prickles on the seed covers, stout and strong, and not pointed very sharp. The leaves from 5 to 7½ inches long, and from 1-16th to 1-13th broad. They grow in threes, and, as I believe, universally so on trees of considerable size. But on trees of but a few years' age, of rapid and luxuriant growth, some few of the sheaths will be found to contain four leaves. But this is the exception, and a rare one. The general rule is that the leaves grow in threes. By this rule, though these trees may vary from each other in the lengths of leaves, and sizes and shapes of cones, still, all are readily distinguishable from any specimen of the short leaf or yellow pine. (*p. variabilis*,) however near such specimen may approach to other usual characteristics of the loblolly pine.

The grain of this wood is very open, the wide intervals soft, and the wood, as timber, of the most worthless description. There is very little heart-wood in large trees—none, or almost none, in the small—and the heart-wood is but little resinous, solid, or durable, as timber. The sap-wood, (when growing) seems much more resinous than the heart. Trees of two feet in diameter usually have but two to three inches of this poor heart-wood. It is only when of small growth, and but rarely then, that the trunks can be riven by wedges, without more labor than profit. When split before growing too large, and after being seasoned or well dried, this wood makes quick burning fuel, of which immense quantities are sold to the north, as well as at home, for the furnaces of steam engines and other uses.

Worthless and despised as is this tree for timber, and for most other uses, it is one of the greatest blessings to our country. It rapidly covers, and with a thick and heavy forest growth, the most barren lands, which otherwise would remain for many years naked and unimproved by rest. By the fallen leaves, which from this tree are very abundant, the impoverished soil is again supplied with the deficient vegetable matter, and, with other aid, may be restored soon to fertility. And the crop of wood, where near enough to market, may be worth threefold of what would be the value of the land, if without this product.

It is not only on dry or arable land that this tree grows vigorously and to a large size. Such may be seen on land much too wet for tillage, and two low for drainage—as on some of the abandoned lands near Lake Mattimuskeet, where the surface of the ground is not more than 18 inches above that of the adjacent waters of Pamlico Sound—and where, also, the salt water is raised by violent winds and strong tides still higher, and sometimes so as to cover the land on which the pines stand. The power of these trees to resist such unnatural visitation and changes of condition, and without apparent injury, is remarkable.

The Great Swamp Pine; or, the Naval Timber Pine. The Slash Pine.—During my first visit to the low lands of North Carolina, bordering on Albemarle Sound, in 1856, I first heard of and saw pines of unusual large sizes and peculiar character, and which were understood by all of the most experienced and intelligent lumber-cutters to be of a different kind from any of the species I have described, or any other known in North Carolina or Virginia. My principal source of information and instruction, in regard to this pine, was Edward H. Herbert, of Princess Anne, a gentleman of much intelligence, and who has for twenty years been principally and very extensively engaged in contracts to supply to the navy yards of the government, timber suitable for the construction of ships of war. In this business he has examined the whole country and has bought, cut and supplied to the government naval stations, much of the largest and best timber, (such only being fit for the masts and other spars of the largest ships of war,) that could be procured in lower Virginia and North Carolina. He has found no pines of any kind except of that now under consideration, large enough and having enough of heart-wood, to make the masts, spars and other timbers, of the largest required size. It should be observed that the proposals advertised for, to supply, by contracts, timber for the United States navy yards, mention and recognize but two kinds of pine timber, "white" and "yellow pine." The former is of the northern white pine, (*p. strobus,*) and the latter designates especially the long-leaf southern pine—but which in usage includes also the short leaf yellow pine, (*p. variabilis,*) and the great pine now to be described. This tree grows only on low and moist land, and is the better for timber, and grows larger, in proportion to the greater richness of the land. It is the principal and largest timber pine in the original forests of all the low, flat and firm, but moist lands, bordering on Albemarle Sound, and also farther South—and I have seen it growing as well, but much more sparsely, on the rich swampy borders of the Roanoke, and in the best gum lands bordering on the Dismal Swamp, and some on the low bottom lands of Tar River. Among the other gigantic forest trees on the rich and wet Roanoke Swamps, (on the land of Henry Burgwyn, Esq.,) mostly of oak, gum, poplar, &c., the few of these pines which yet remain, tower far above all others, (twenty feet or more,) so as to be seen and distinguished at some miles distance. I have visited several standing trees and the stumps of others that had been cut down, which measured either nearly or quite five feet in diameter, and were supposed to have been from one hundred and fifty to one hundred and seventy feet in height. But the sizes and heights of the trees may best be inferred from the list below of hewn (or squared) stocks, which was furnished to me from Mr. Herbert's timber accounts. These stocks were cut in Bertie, N. C., made the whole of one raft which was then (May, 1856,) on its passage through the Dismal Swamp Canal to New York. The stocks were thence to be shipped to Amsterdam for naval construction, under a contract with the Dutch Government.

	Length.	Inches Square.	Number Cubic feet.
1	47	25	204
2	66	19	165
3	86	30	537
4	79	31	527
5	88	23	337
6	65	20	181
7	74	26	347
8	80	26	376
9	68	24	272
10	58	22	195
11	86	30	537
12	58	30	363
13	74	26	347
14	74	26	347
15	70	28	381
16	70	27	368

But even the longest of these stocks ' not approach the magnitude of one wh was cut at a previous time in Bertie sold in New York by Mr. Herbert. This was eighty feet in length and thirty-six inches square at the lower end. He sold it to a dealer for five hundred dollars, and the buyer re-sold it for six hundred dollars. This stock did not retain its stated diameter (at the butt) to its upper extremity, but was there from twenty-eight to thirty inches square. All these stocks were nearly all of heart-wood. It is required that two-thirds of the surface of each side of every stock shall be of heart-wood. Of course this condition permits but little sap-wood, and that only in the angles of the squared stocks. Thence, also, it follows that the proportion of heart-wood in these trees must be very large. The timber must be resinous or it would not be good, and it must be durable, or it would not serve for the masts and other great spars of ships of war, exposed to alternations of wetting and drying, and for which the best materials only are permitted to be used. The grain of this heart wood is not generally very coarse, but more so than the long leaf, and still more than the short leaf yellow pine. Mr. Herbert, the better to aid my investigations, procured from the navy yard of Gosport, a thin cross section of the stock used for a mast of the U. S. war steamer Roanoke, which also he had cut in Bertie. The section is of the stock hewed to twenty-seven inches square, and of which but a very little sap-wood was in the two corners of one side only. As the tree was not entirely straight, the centre of the heart is thrown considerably to one side of the centre of the end of the stock, where the section was cut off. The heart wood was 34½ inches diameter, and contained 186 rings, (as measured and counted on the wider side, or radius, which, from the centre of the heart, measured 17¼ inches.

The remaining sap-wood, 3¼ inches, contained 116 rings, or 32⅓ average to the inch.

Whole number of rings left visible in the stock 302.

A radius of three inches from centre, of heart-wood, took in 19 ring marks.

A radius of six inches from centre of heart-wood, took in 34 rings, or 5⅔ average to the inch.

The outer inch of sap-wood, (not outside the tree,) 49 rings.

The outer rings in the sap-wood, visible [illegible]he corners, were so very close as to be indistinct; and, perhaps, some of them were omitted in the counting, though the examination was aided by a magnifying glass. In addition, and which makes a much larger omission, neither corner extended to the outer part of the sap-wood of the tree; and, therefore, if only an inch was cut off, it made the loss of at least fifty rings and years' growth. It is probable that this tree had considerably more than 300 rings, indicating as many years of life and growth. How much older must have been the tree which made the largest stock named, or other trees of five feet or more in diameter!

With such size and value of this tree, and such marked differences from every other pine known in the same region, it is not strange that nearly all opinions of the residents, and of those of most practical acquaintances with pines and their timber, should have agreed, and without exception or doubt, that this was a peculiar species. So I learned from every source of instruction, and so I believed until recently, when the comparison of all my information and personal observations made me not only doubt the fact of this being a distinct species, but induced me fully to believe that this tree, of the most magnificent and superior size and valuable and remarkable qualities for timber, is identical in species with the universally despised loblolly pine, which is almost without heart-wood, and is the most worthless and perishable material for timber; and that great age and slower growth, and in some measure a better and a moister soil, are all that have caused the different qualities and the great superiority of the old swamp pines. I know that this opinion would be deemed absurd by persons the most acquainted with these different trees and their timber. I will proceed to state the grounds for my change of opinion.

When, at first, fully believing (as instructed by others) that this swamp pine was a different kind, it was necessary thence for me to infer that Michaux, who personally and carefully examined so many of our forests and trees, and also all other botanists, were ignorant of the existence of this noble tree, which exhibits its superior magnitude over so much extent of our country. It is probable, indeed, that even the laborious and careful Michaux did not, in his travels, pass through, even if he entered, the lowland region on and near the Albemarle Sound—a region which is still almost a *terra-incognita* to all other persons than the residents and near neighbors. For if these trees had been seen on the natural soil, in their most perfect conditions of size and value, whatever might have been their species, they could scarcely have passed, as they have done, without being mentioned by any botanical writer. If not the *p. tæda*, these trees cannot belong to any other of the species of this country; and, therefore they would the more attract a botanist's attention, and induce particular notice and description, as presenting a new and before undescribed species—or at least new in this locality. And if they had been observed, and recognized as the *pinus tæda*, a scientific observer, like Michaux, could scarcely have omitted all notice of the remarkable differences between these large and valuable timber-trees and the ordinary and understood general character of that well known species. If the usually accurate Michaux had known this tree, its great size and value for timber, and its preferred moist and rich soil—and if he had also known that it was the *pinus tæda*, or loblolly pine—he could not have used the following expressions, in describing the latter species, as he has done, without limitation or exception. He says of the loblolly pine: "In the lower part of Virginia, and of North Carolina northeast of Cape Fear River, over an extent of nearly two hundred miles, it grows wherever the soil is dry and sandy." And again: "It exceeds eighty feet in height, with a diameter of two to three feet," &c. "In trunks three feet in diameter, I have constantly found thirty inches of the sap-wood, and in those of a foot in diameter, not more than an inch of heart." "The concentrical circles of the long-leaf pine (*p. australis*) are twelve times as numerous in the same space" [as of the loblolly pine]. "This species is applied only to secondary uses [for inferior purposes]; it decays rapidly when exposed to the air, and is regarded as one of the least valuable of pines. Though little esteemed in America, it would be an important acquisition to the south of Europe," on account of its rapid growth and fine appearance, and use of the timber for "secondary" purposes.

The only pines of the higher range of country which resemble, or even approach, the lowland swamp-pine, in character, is what is there called the "slash pine," common in the higher tide-water counties, and growing on high land, but only either in the narrow, oozy bottoms, or in the forest "slashes," or shallow depressions of the table or nearly level ridge-lands. These depressions have a close and stiff, though still sandy, soil and subsoil, serving to hold the rain-water and to convert the depressions to shallow ponds in wet weather, in winter and spring, until the collected rain-water evaporates in summer. In these very limited spaces, only, grow the few slash pines—of large size, and of coarse-grained, but durable and large, heart-timber. This, and also the swamp-pine of the low country, have their leaves in threes, and both the leaves and cones of the like sizes and general appearance with those of the common loblolly pines. For want of botanical knowledge, or any aid of instruction from others better informed in these respects, I could not compare these trees by their marks of botanical description and distinction of species. Experienced lumber-cutters can readily distinguish these trees by their general appearance, in respect to their value and fitness for timber; but I have found no one who could certainly distinguish them by any differences of their growth, and the sizes or shapes of their leaves or cones, from the *p. tæda*. Further, no one can certainly designate either a young swamp or slash pine. They are only known as such when old enough to have large heart-wood.

If the loblolly pine will become by sufficient age on rich soil, a "swamp pine," it may seem very strange that even the largest of the former (known to be the loblolly) never show large heart-wood. But nearly all these largest trees are of second growth, on abandoned fields, and few have ever reached sixty years old before the land is again cleared. And even if left to stand much longer, which I have never known, no second-growth pine can date farther back than the exhaustion and abandonment of the earliest cleared lands, or about two hundred years. In the case of the pine for the mast of the Roanoke, the latest found ring of heart-wood is certainly of growth one hundred and sixteen years old, at least. Of the few loblolly trees (admitted to be such) standing in original forests, the growth was slower, and, for their size, their heart-wood is of larger size than those of second growth, on land formerly under tillage. Some of these trees will be offered as examples; and, in some cases, it would be difficult even for a timber-cutter to pronounce whether particular trees, which will be named, should be classed as old loblolly pines, or swamp or slash pines, (according to localities) too young, or of too rapid growth, to have large hearts, or to be good for timber. Even where the best of these swamp pines are cut, there are some trees of so much smaller-sized heart-wood that the cutters have found it necessary to designate them by such terms as "yearling [*i. e.* young] swamp pine," and "bastard swamp pine." All these things go to confirm my position, that there is no specific difference between the loblolly and the swamp and slash pines.

The dimensions, &c., of sundry trees of this species, which appear in the following statement, with but one exception, were observed and noted by myself. The list includes trees of second growth, which all persons would pronounce to be loblolly pine; others, of original growth, which are undoubtedly such as are deemed swamp or slash pines, and good timber-trees; and others, which it would be difficult for those persons who maintain there are two kinds to say to which they belong:

	Number.	DESCRIPTION OF SOILS.	Diam. of trunk (exclusive of bark) at height of stump.	Diameter of heart-wood.	Total number of rings in tree, at stump.	Number of rings in heart-wood.	Maximum width of rings (in heart) to inch.	Minimum width of rings (in sap) to the inch.	Number of rings in outside inch of sap-wood.	REMARKS.
2d growth.	1	Dry, sandy slope.	20	2	48	7	1–2	1–6	6½	Formerly cultivated and worn out; still poor.
	2	Dry, sandy slope.	21	4	44	8	..	..	8	
	3	Dry, sandy level.	10	0	..	..	..	..	..	
	4	Dry, sandy level.	11	1¾	..	..	..	..	..	
Forest Land never cleared.	5	Dry, sandy slope.	17½	2	40	3	..	..	..	Land, less than medium fertility.
	6	Dry, sandy slope.	22½	6	48	7	1–2	1–14	12	
	7	Dry, sandy slope.	19	4½	49	5	..	..	15	
	8	Level, rather moist.	18	5¼	75	7	1–2	1–30	..	Not oozy, but would require draining if tilled.
	9		21½	9	74	18	3–5	1–30	12	
	10	Sandy and oozy.	21½	6	58	13	1–4	1–13	6½	On flat at foot of, and near to, oozy hill-side. All the above in Hanover.
	11	Sandy and oozy.	32	8	95	32	1–3	1–16	9½	
	12	Sandy and oozy.	21	6	96	43	3–20	1–25	12	
	13	Stiff, sandy bottom.	26½	9¾	97	28	..	..	16	Prince George County.
	14	Oozy slash.	39	32	141	63	3–5	1–28	17	Tree 130 feet high—Hanover.
	15	Oozy slash.	37½	27½	204	85	1–4	1–18	15	Tree 110 feet high—Hanover.
	16	Oozy slash.	37½	31	269	187	1–5	..	66	Hanover.
	17	Low, but firm, sandy.	42	35¼	283	207	..	..	..	Tree 148 ft. Washington co., N. C.
	18	Firm, low and moist.	60	47	280	170	..	..	..	Tree 170 ft. Washington co., N. C.
	19	Low and rich.	41	34½	302	186	1–3	1–60	49	Mast of the Roanoke steamship-of-war, from Bartie, N. C.
	20	Firm, low, moist.	46	39	...	184	..	..	..	Near Tarborough, N. C; these dimensions at 30 feet high—the lower part having been removed for timber, and stump damaged.

The trees numbered 14, 15 and 16, may unquestionably be put with the "swamp pines" of the low country. Those numbered from 7 to 12, of much less age, only approach, in sizes of heart-wood, to good timber, which they might have attained to, if left to grow two more centuries.

It is not only the loblolly pine that is extremely deficient in heart-wood until of advanced age. Though in less degree, this defect is often found also in the short-leaf pine, (*p. variabilis*) which, generally, is the best yellow pine timber-tree of the higher country. Some trees of this kind, of original forest growth, of twenty or more inches in diameter, have less than four inches thickness of heart. If of second growth, these trees would have had still less of heart generally.

It is not always plain where to fix upon the dividing line in a tree, between the heart and sapwood; nor is the line of junction always regular or parallel with the rings of grain near the earth. Also, in trees like No. 16, which are nearly all of heart-wood, the little sap is so resinous that it can scarcely be distinguished, except as being living wood, when the tree is first cut down.*

Pond Pine. Pinus Serotina.—Michaux says that this pine is "rare and fit for no use"—and states the "ordinary size, thirty-five to forty feet in height, and fifteen to eighteen inches in diameter." By these and other indications, I sought in vain for this pine, by such slight and distant observation as is afforded to a traveller, through wet lands,—and in some cases failed to distinguish it, even when my later and more close inspection showed that it formed the principal, if not the sole forest growth for miles together. This great oversight was caused to me by the inaccuracy of Michaux's description of the height, and also by the actual general resemblance of the trees to the *pinus tæda*. And between these two, as species, the residents best acquainted with both have not observed any difference. It is not true that, differences of general appearance, and of growth, are recognized by all—and even a different name, the "savanna pine," is commonly applied to the species now under consideration, where the trees make the general growth, on the wettest savanna or boggy swamps. But the usual smaller sizes, and

* Whilst engaged in the investigation of this subject, and particularly as to the question of the species of the valuable "swamp pine," and its being identical in species, or not, with the worthless "old field" or loblolly pine, I sought scientific information from Dr. James F. McRee, of Wilmington. No person was better qualified to instruct, and to decide doubts, on this question, than Dr. McRee—not only because of his extensive botanical knowledge, but, also, as being a native and long resident of the region in which these pines (generally supposed of two different kinds) grow in great number and in their greatest perfection of size and luxuriance. Failing to find him at home, I made my inquiries by letter, and subsequently received from him, though after this writing was completed, full confirmation of the correctness of my position—that the above trees, deemed so different by all lumber-cutters, are the same. The question of identity had previously attracted Dr. McRee's attention, not only as a botanist, but as a proprietor of pine forest, in which these trees were abundant, and of which it was important to designate those best for timber and for sale. He says, in his letter, that "both kinds [deemed the most distinct and altogether different by all lumber-cutters and carpenters,] when subjected to the closest botanical scrutiny, show no signs of specific difference. Of this you will be better assured, when I inform you that I have recently had the pleasure of a visit from the Rev. M. A. Curtis, (than whom there is no better botanist South of the Potomac) when we examined together two varieties of the *p. tæda* spoken of, and he unhesitatingly agrees in opinion with me as to their identity." "You will find the two varieties of the *p. tæda* recognized by Elliot, who calls the 'swamp pine' *p. tæda*, and the 'loblolly' *var. Heterophylla*"—[which latter is recognized by all other botanists as simply *p. tæda.*]

Dr. McRee says that the experienced timber-cutters profess to be able to distinguish, at the first glance, the difference between the two (so-called) kinds of pine. And this they can generally do, from external signs—that is, they can judge whether a standing tree has much heart, [which they would call "swamp pine" generally, but to which, near Wilmington, they give the name of "rosemary pine," which elsewhere is given exclusively to the *p. variabilis.*] or but little heart, in which case they call it loblolly. But, by external examination, with the aid and direction of one of the most experienced and intelligent lumberers, who was fully satisfied of the difference of these trees, and of his ability always to designate them, Dr. McRee found that even the actual and *only* differences, as to the size of heart-wood and the comparative value for timber, in numerous cases, could only be determined by applying the axe, and so reaching the heart.

apparently more imperfect or stunted growth, and ugly shapes of the "savanna pines" are ascribed to the exposed unfavourable and unnatural situation in which they stand, in mire and water, and not to any fixed difference of kind, between these and the *pinus tæda* on dry or dryer soils. Indeed, the cones furnish the only certain indication of the pond pine. They remain on the tree, and unopened, for six months (or perhaps a year) after ripening—are very compact, and some of them (but not always, as we would infer from the description and figure given by Michaux,) are perfectly egg-shaped. But more generally, while they approach this shape, they are rather broader near the base, and more pointed at the top, so as to be about midway in shape between conical and oval. The cones, three or four together, often grow out from and surround a twig. Their close surface, and their remaining closed so long, and also their peculiar forms make these cones more beautiful than any others. The cones, and especially those in clusters, would be valued as mantel ornaments. The cones are about two and a half inches long, and one and seven-eights broad. The leaves grow in *threes*, and are from five to seven inches long; and very like those of the loblolly pine. I have never met with these pines in Virginia, though, from description, I infer that they are found, in numbers, in parts of the Dismal Swamp. I first was enabled to recognize and identify the tree, as the *pinus serotina*, in the low swamp lands north of Lake Mattamuskeet, along the canal to Alligator River. There it grows in considerable numbers, mostly from eight to twelve inches in diameter, and rarely eighteen. They form the sparse but unmixed forest growth on large surfaces of wet savanna land on both sides of Pungo river. These were peat lands, which had been burnt over, and are so low and wet as to be deemed worthless. But, also, on the rich swamp land near Lake Scuppernong, (the farm of Charles Pettigrew, Esq., in Tyrrel County,) which had not yet been brought under culture, and which had been burnt over and left naked, many years ago, the next succeeding forest growth was wholly of the pond pine, and of which many of the largest appeared to be eighteen inches in diameter, and eighty feet high. Also, on the thinner swamp soil near the canal of Mr. McRee, in Washington County, (near Plymouth, N. C.,) the general forest growth, for a mile or more, and generally of large size, is of this particular pine. Yet neither Mr. McRee, nor any of the neighbouring residents, had suspected that these trees were of different species from the ordinary loblolly or "old field" pine; and under this mistaken impression, this body of swamp land is generally supposed to be of little fertility, because covered (as supposed) by a growth, which indicates poor land. I do not pretend to pronounce, on my very cursory view, that this land is not of inferior fertility—nor that the pond pine may not grow on poor land, provided it is peaty and very wet. But, this pine growing and thriving, and either generally or exclusively making the forest cover, is certainly no indication of poor soil, because it grows thus on the richest, of which the case cited above of the Scuppernong swamp land is full proof.

This tree has more heart, and more resin in its sap-wood, than the loblolly; and very different from the latter, the pond pine furnishes good and durable timber, for such purposes as the small trunks will suit. Masts for small vessels are made of those growing on the low and wet swamp of Mattamuskeet. As a wet (and perhaps, also, a peaty,) soil is most favourable, if not essential, to the growth of this pine, it is probable that on the wettest land it may have the most heart-wood, and serve for the best timber. Where it grows on dryer (though still wet) land, near Lake Scuppernong, it had been understood that this pine had more heart-wood, and was of more value, than the *pinus tæda* of the neighbouring dry and poor lands—but the superiority was not so marked, or appreciated so highly, as I heard of in other places, where the pond pines grew on much wetter lands.

Pitch Pine. Pinus Rigida.—I have seen and recognized this tree (as supposed) in but very few cases in Prince George's Co., Md., and in Culpeper, Va. But all that were observed were trees of young growth, and therefore the only indications of the kind were in the leaves and cones. The trees which I saw and supposed to be of this kind, had leaves thicker and more rigid than usual of other common kinds, three to four inches long, and growing in *threes*. The cones (in Maryland) about two inches long, and as seen open, nearly spherical in general outline. In our Alleghany region, this tree supplies much of the pine timber used in buildings, and in planks exposed to view, would attract notice by the great number of knots. But except in small trees, which only were accessible to me, and which do not offer good and reliable specimens of growth, &c., I had no opportunity for fully examining the growing trees, and comparing them with others. I have never (with certainty) seen and known this tree in lower Virginia or North Carolina.* But as it would seem from some of Michaux's words that it is in this region, and as, possibly, I may even have seen trees of this species without distinguishing them from some other kind, I will abridge the description given in the American edition of Michaux's work. Some passages of this description seem to contradict others, to which contradictions I will invite notice by marking them in italics. Michaux says of the *Pinus rigida* that it is "known in all the United States by the name of 'Pitch pine,' and sometimes in Virginia as 'Black pine.' *Except the maritime parts of the Atlantic States,* and the fertile regions West of the Alleghany mountains, it is found throughout the United States, but most abundantly *upon the Atlantic Coast,* where the soil is diversified, but generally meagre." "In Pennsylvania and Virginia the ridges of the Alleghanies are sometimes covered with it. Near Bedford in Pennsylvania, where the soil is more generous, the pitch pine is thirty-five to forty feet high, and twelve to fifteen inches in diameter." "Its most Northern localities are Maine and Vermont, where it does not exceed twelve to fifteen feet high." "*In lower parts of New Jersey, Pennsylvania and Maryland,* it is frequently seen in the large swamps filled with red [white ?] cedar, which are constantly miry, or covered with water; in such situations it is seventy or eighty feet high, and twenty to twenty-eight inches in diameter."—"It supports a long time the presence of sea-water, which, in spring-tides, overflows the *salt meadows,* where sometimes this tree is found alone, of all its genus." The buds are always resinous, and its triple leaves vary in length from 1½ to 7 inches, according to the degree of moisture of the soil."—"Size of cones depend on nature of the soil, and varies from less than one to more than three inches in length. They are pyramidal in shape, and each scale is pointed with an acute spire about two inches [lines ?] long." A note to this text of Michaux, by J. J. Smith, says that the *p. rigida* sometimes attains the height of 100 feet, and four or five in diameter.* J. J. Smith also adds a characteristic of this pine, which I have not known in any other. "It differs from other trees of this family in its stump throwing up sprouts the spring after the tree has been felled; but these do not attain any considerable height. The fallen trunk also throws out sprouts the succeeding summer."

Michaux further says that the *p. rigida* is remarkable for the number of branches which occupy two-thirds of the trunk and render the wood extremely knotty. The concentric circles widely distant; three-fourths of the larger stocks consist of sap. On mountains and gravelly land the wood is compact and surcharged with resin; in swamps it is light, soft, and composed almost wholly of sap. From the most resinous stocks is procured the lamp-black of commerce. Tar is made of this pine in the Northern States and Canada, as it is of the *p. variabilis* in lower Virginia.

Perhaps the foregoing description may enable some observer to be more successful than myself in finding and distinguishing this pine in the low country of Virginia or North Carolina. Also it may prevent from being confounded with this pine either the *p. serotina* (which Michaux says "strikingly resembles" the *p. rigida,*) or the *p. tæda,* when in low and wet ground, or exposed to wet, or sometimes reached by salt water.

Having now described separately each species of this region, and some others for better distinction, I will return to more general remarks, or the consideration and

* I have since seen a few young trees of this species in Albemarle, on the road from Charlottesville to Ridgeway on the Rivanna. These compared to the surrounding and ordinary growth of *pinus variabilis,* were very different—and especially in the much thicker and more rigid leaves of the *p. rigida*—and also in the general appearance, in tint and outlines, of the two kinds of young trees.

* This statement of sizes, induces a suspicion that the writer, (Smith,) had mistaken the great swamp pine (*p. tæda,*) for the *p. rigida.*

comparison of different species in connection.

The short leaf yellow pine, (*p. variabilis,*) is the principal tree of the original forests of the upper range of the tide-water region of Virginia, and also above the falls as far up the country as the usual growth of any pines extend continuously. For, at some distance above, as supposed from change of soil, the entire growth of pines ceases and gives place to a general growth mostly of different kinds of oak. Proceeding South-eastward to the low and wet country, this pine becomes more scarce, and is more and more substituted by the swamp or loblolly pine as original growth; and more Southward and on higher lands, and throughout Eastern North Carolina, the long leaf pine generally is the principine of the original forests. When any of these several forest growths were cleared off for tillage, and the lands were afterwards worn out and then thrown out of cultivation, several different pines in different places, as second growth, entirely occupy these second lands, and in most cases the second growth is entirely different in species from the pine of the first growth. Thus, in nearly all of the tide-water region of North Carolina and on most of that of Virginia, the almost universal second growth pine is the loblolly, or "old field" pine, as thence called, which succeeds to the original short leaf pine below the falls in Virginia, (and also for a short distance above) and also to the original long leaf pine in North Carolina, and occupies, exclusively, in the abandoned former places of both, the ground which this pine had originally, but partially shared with the short leaf and other trees. In the Northern Neck of Virginia, on some other lands near to rivers, and also in the more Northern counties above the falls, (as Fairfax,) the cedar pine (*p. inops*) is the principal second growth, or is the "old field" pine of those lands. Further, the Southern and lower Piedmont lands of Virginia, but not so low as the line of the falls, when abandoned, also are covered and exclusively with *their* "old field" pine, and which is so termed in Amelia, Cumberland, and that range of counties, and in Orange, in North Carolina. But the second growth pines of this higher range of country is not like that of the lower range, but is no other than the short leaf yellow pine, (*p. variabilis.*) Thus it is, the loblolly, which is the almost entire second growth of nearly all the tide-water region, refuses to grow at a short distance (generally varying from five to twenty miles) and at an irregular line of termination, above the falls, while the short leaf pine continues thence and covers all the abandoned fields for some distance farther up the country, after which that particular pine growth also ceases. Yet, because of the same name of "old field" being used in both places, many farmers and residents suppose both pines to be of the same species. And very many farmers of the lower country where the first and second growth pines are of different species, (*variabilis* and *tæda*, respectively,) suppose them to be the same kind, but altered in appearance and manner of growth by the difference of the lands and other circumstances. Of these facts, in regard to remote localities, I have to rely more on information than on my own limited personal observation. But in Prince George and Hanover counties, in which I have resided, and in more of the upper and middle range of the tide-water country, I have seen much, and have noted such general facts as these: In the original forests of the ordinary poor soils, or of medium fertility and dry land, not one pine tree in fifty is a loblolly, and all the others are short leaf pines. And of the few loblolly pines there found, they are of smaller and younger growths, if scattered among the short leaf pines. Or if (as rarely) a number of loblolly pines are seen near together and occupying the ground either partially or exclusively, it is either when the short leaf pines had been formerly cut out or otherwise destroyed, or where the moisture of the soil forbade their healthy growth, or where the ground, (in soil, sub-soil and all below for sundry feet,) was so sandy as to be unfavourable to the short leaf pine, though not to the loblolly.

As particular observations, made with a view to certain objects, are always more accurate and reliable than far more extended and general observations made without any particular object, I have recently made for this purpose a particular examination on parts of the forest and waste lands of Marlbourn farm. First, in a body of original forest land, high, dry, of sandy soil, but having clay below, and of but moderate productive power, (or below medium fertility,) short leaf pines made the principal growth, and all of the largest pine growth.

The loblolly pines were not one to fifty of the former, and nearly all of these few were of small size. On one side of this body of old forest land is a very poor old field of similar soil, abandoned from eight to ten years past, and now covered thinly with young pines of five years old or less. (The earlier of this second growth had been cut down.) Of these young trees, perhaps one in ten to twenty is a short leaf pine, and these are always of smaller size than the much more numerous loblolly pines. On the other side of the forest land there is another small body of "old field" pine growth, the largest trees being about ten inches through, and mostly of different smaller sizes. Of these not one in three hundred was a short leaf, or any other than a loblolly pine, and the few others, of short leaf, were so small that if all are let alone to stand, these last will certainly perish, because being so over-topped and shaded by the others of much larger sizes and greater vigour of growth.

From these and other more general observations, it would seem that in this region the loblolly pine was more lately introduced (or the winged seeds transported here from abroad by the winds,) than the short leaf, and could not obtain a proper seed-bed and maintain a healthy growth in lands already and completely occupied by other established pines and other trees. But when worn out vacant lands were offered, the opposite result followed. The seeds of both these kinds of pines were everywhere numerous enough, and were so readily transported to great distances by the winds, that there was no deficiency of either kind on any land. But, in such vacant fields, or when these two kinds of pine were equally in possession, the loblolly pine is much the fastest grower, and in a few years over-tops the smaller short leaf pines, which, therefore, are unthrifty, and in time are overpowered and die under the shade and crowding of the large and more vigorous loblolly pines. Hence, in a thick and long standing second growth, however numerous the slower growing short leaf pines may have been at first, not one might live when the eldest of the others had reached to forty years. On the particular abandoned lands where pines of second growth thrive best and grow fastest, they usually stand so thick, when young, that many of the smaller and weaker necessarily must die, and thus make room for the more vigorous. In such cases, of course the short leaf trees, of slower growth and smaller size, would certainly be among the first to perish. It is only when the growth is thin, owing to some unfavourable conditions of the soil, that in this region the short leaf pine can live in numbers, intermixed with the loblolly, as second growth; there being, in that case, enough space for both to live.

But in the higher range of country other causes operate. The land there is naturally much richer than the dry land in the lower country, the soil red, more clayey, and having not enough acid, (or having too much lime,) to permit the growth of the loblolly pine, which is especially favoured by the most acid soil, and also by sandy soil. But the short leaf pine can grow and thrive on soils stiffer, richer and better constituted for fertility, and therefore can occupy such land to the entire exclusion of the loblolly pine. But still, even the short leaf species does not thrive as well on a good agricultural soil not very deficient in lime. Therefore, according as the soil is better constituted for tillage crops, these pines are more sparse and slow in growth, and on the best natural soils they will not grow at all, as on the South West Mountain lands and the limestone soils of the more Western mountain country, and rich alluvial bottoms everywhere.

I will here present an opinion on this subject which will not be maintained by argument, to do which would require too much space, and would be here out of place. This opinion is, that the soils and upper layers of all the tide-water region of Virginia and North Carolina, and also an adjacent strip, of irregular breadth and outline, above the falls, are of drift formation, the materials of the drift having been washed by an enormous flood from the lands lying above, and which were denuded in supplying that material. That the whole region so formed by drift is extremely deficient in lime, (and much more so than the denuded region above,) and therefore naturally acid, consequently especially favourable to the growth of loblolly pines. If this opinion is correct, it will be much more important than merely for assigning the necessary localities and actual limits for the healthy growth of loblolly pines. For the ascertaining the limits of the drift formation and the places where it is present or absent, will serve to indicate where lime, as manure, will either be highly beneficial, as in all the low country, or where it will probably be of little benefit, or none, as is said to be generally the case on the red Piedmont lands. This subject of drift formation and the drift-formed region and its localities, I have treated at length elsewhere, and therefore I will pursue it no farther here.

From the various facts and opinions stated in the foregoing pages, it will have appeared incidentally that some (if not all) of the species of pines, are especially good and reliable indications of the character and constitution of the soils on which they grow, and in some cases of climate also. Thus all the pines common in this region, prefer to grow on soils, if dry, of but moderate or a low degree of natural fertility. The white pine (*p. strobus,*) which, however, is not of either the lowland or the Piedmont region, is the only species known to prefer well constituted, rich, and also dry agricultural soils. The long leaf pine, (*p. australis,*) requires a Southern locality or climate, and with that, a dry, sandy, and poor soil, and also sandy sub-soil, and its healthy and general growth is an indication of the presence of all these different requisites. The short leaf pine, (*p. variabilis,*) prefers stiffer soil or underlying earth, both to be dry. This will bear more of lime in the soil than either the preceding, (except *p. strobus,*) or than the loblolly. The cedar pine, (*p. inops.*) is more rare, and its habits less known to me. But this would seem, (as a second growth,) to prefer and indicate still better original soils, however exhausted subsequently, than either of the preceding pines of this region, and also of more clayey constitution. The loblolly grows well both on dry, sandy and poor soils, and on moist, deep and rich soils. But in both of these very different positions it must have acid soil. And this last condition is caused and provided by the great deficiency of all forms of lime in the poorest natural soils, and also by the great excess of vegetable matter and swampy or peaty lands.

Time is the most precious, and yet the most brittle jewel we have; it is what every man bids largely for, when he wants it, but squanders it away when he gets it.

How to Improve Cider.

Prof. Horsford, the chemist, has recently communicated to the Massachusetts Horticultural Society a recipe for the improvement and preservation of cider, which he recommends to general trial. It is as follows:

"Let the new cider from sour apples—sound and selected fruit is to be preferred—ferment from one to three weeks, as the weather is warm or cool. When it has attained to lively fermentation, add to each gallon, according to its acidity, from half a pound to two pounds of white crushed sugar, and let the whole ferment until it possesess precisely the taste which it is desired should be permanent. In this condition, pour out a quart of the cider and add for each gallon one quarter of an ounce of sulphate of lime, known as an article of manufacture under the name of 'anti-chloride of lime.' Stir the powder and cider until intimately mixed, and return the emulsion to the fermenting liquid. Agitate briskly and thoroughly for a few moments, and then let the cider settle. The fermentation will cease at once. When, after a few days the cider has become clear, draw off and bottle carefully, or remove the sediment and return to the original vessel. If loosely corked, or kept in a barrel on draught, it will retain its taste as a still cider. If preserved in bottles carefully corked, which is better, it will become a sparkling cider, and may be kept indefinitely long."—*N. Y. Observer.*

Palpitation of the Heart.

At one of the meetings of the Physico-medical Society at Wurzburk, Prof. Kolliker communicated that he had found a remedy to relieve in certain cases morbid palpitation of the heart. Reasoning from the experimentally established influence of the severe and constantly returning palpitation, to relieve it by deep inspirations and subsequent holding of the breath. The advice was followed by good effect, a few deep respirations and moderate holding of the breath sufficing to arrest the palpitation for one or two days. Prof. Bamberger remarked that the expansion of the lungs, causing them to overlap the heart more fully, might render the palpitation only less perceptible, without actually arresting it. To this Kolliker replied, that it was improbable, because after a few deep inspirations palpitations had ceased, which otherwise had lasted for hours.

[*Medical and Surgical Reporter*

For the Southern Planter.

Ice-Gathering.

HANOVER COURT-HOUSE,
Dec. 31, 1858.

Editor of the So. Planter,

SIR—The peculiar character of the winter thus far having produced some uneasiness in regard to the ice crop in the vicinity of Richmond, I send you, as likely to be interesting to your readers, memoranda from my journal of the dates of ice-getting for the past six seasons, premising, however, that after the ice is one and a half inches thick, I never allow the freeze to pass without getting what I can. For the two first seasons I filled one house; since then, two.

Your obedient servant, X.

1853—Jan'y 21,	2 @ 3½	inches	thick.
29,	3	"	"
1854—Jan'y 4,	4 @ 6	"	"
Dec'r 23,	1½@ 4	"	"
1855—Jan'y 31,	2	"	"
Feb'y 5,	2	"	"
" 8,	3	"	"
1856—Jan'y 3,	1½	"	"
" 10,	9	"	"
" 11,	9	"	"
" 14,	10	"	"
Dec'r 24,	3½	"	"
" 30,	5	"	"
1858—Feb'y 17,	2½	"	"
" 23,	4	"	"

For the Southern Planter.

A CARD.

COMMUNICATED BY MESSRS. FOWLE & CO.

Near Ivy Depot, Albemarle Co.,
Dec. 25, 1858.

Dear Sirs—Yours of 11th instant, asking me to give the result of the application of Sombrero Guano procured of you last Spring, was duly received, and thinking I would learn of my neighbours the result of their application, delayed my reply till now. I have, however, seen no one who used it but Mr. Raleigh Colston, who had also received a letter from you, and spoke of replying very soon.

I applied from 250 to 300 pounds of a mixture of Peruvian and Sombrero Guano, mixed in the proportion of one bushel by measure of Sombrero to two of Peruvian. The first weighing 90 pounds to the bushel, the last from 57 to 60. On similar soil, immediately adjoining, I applied about 12 bushels of Bone Dust and 150 pounds of Peruvian to the acre. The land where this last application was made was planted first, manured with farm pen manure, prepared and hilled first. The crop was better where the mixture of Sombrero and Peruvian was applied. While the tobacco crop is so frequently affected by a variety of circumstances, apparently trivial and slight, such as the time of working it, the season for planting, the condition of the weather, immediately afterwards, &c., &c., the difference above alluded to may not have been attributable to the Sombrero Guano, still I am forcibly impressed with the result, and shall make the same application to my tobacco land next season. The land above alluded to is naturally good, being branch flats, and on all, excepting a small portion where Sombrero was used, farm pen manure was moderately applied.

My neighbour, Mr. Raleigh Colston, used no other manure but a mixture of Peruvian and Sombrero Guano, and his crop of tobacco was remarkably good, peculiarly so, considering the quality of the soil and the character of the season. Examining his crop when a good deal was ready for cutting, I frankly told him his was the best I had seen with the above qualifications. The Sombrero I procured of you last fall, I mixed in the proportion of one bushel by measure to three of Peruvian, and applied it to wheat, with the drill, excepting some land rather steep and stony where I sowed it broadcast, I can form no opinion yet of its effects, but having used some of De Burg's Excelsior, and California or Elide Island Guano, will take pleasure in reporting comparative effects.

The last ton of Sombrero you sent me was properly ground, as fine as plaster generally is. Prepared in this way, no farmer, who has any regard for economy, will purchase Manipulated Guano, when he can save at least from eight to ten dollars per ton, by purchasing the materials and making a thorough mixture, with very little trouble. On a rainy day, without a Peruvian Guano Grinder, several tons can be prepared and mixed as thoroughly on a barn floor as it can be done by any machinery whatever.

Purchasing the two guanos of you, one at \$56 per ton of 2,000 pounds, the other at \$28, equal parts of each mixed (that is by weight) a ton would cost $42, and one knows precisely what the mixture is composed of.

Peruvian Guano alone cannot always be uniformly distributed with the drill, depending on its condition as to dryness, &c., and the state of the weather, but a mixture with Sombrero obviates to a great extent these difficulties. Furnishing it at the comparatively low price which you do, and prepared far superior to any I have seen ground elsewhere, I am sure you will dispose of a very large amount next season.

Most truly and faithfully yours, &c.,

JOHN R. WOODS.

Messrs. Fowle & Co., Alexandria, Va.

Cultivation of Clover.

RED CLOVER. (*Trifolium Pratense.*)

BY S. B. NOBLE.

Clover is a leguminous, biennial plant—some varieties of which are indigenous to almost all parts of the globe. Under certain circumstances it will become perennial. In England, Scotland and Germany, red clover is called an exotic, and it is difficult to say to what country it is indigenous. It has become an almost universal favorite among agriculturists in all countries; and in many portions of our wheat growing districts it is thought to be indispensable in raising a crop of that staple. As a fertilizer it has not an equal among any of the leguminous plants.

VARIETIES.

The varieties of clover are quite numerous, but as red clover is the one most cultivated, we shall confine our article to that variety. Of red clover it is supposed there are three kinds; one a large, coarse kind, the latest of the three, and of the least value; another variety is called the medium, and is the most cultivated: the other is a small variety, and cultivated to a small extent; an early, fine textured kind, but small.

OBJECT OF CULTIVATION.

There is a three-fold object in cultivating clover, viz: for pasture, for hay, and another, the most important of the three, is, for a fertilizer. It is rich in nutriment, according to Professor Johnston, who analyzed a first crop from an acre of land, and found it to contain the following ingredients:

	lbs.
Albumen, gluten and casein	430
Fat, oil, &c	143
Starch, sugar, gum and dextrine,	1,825
Fiber and husk,	1,156
	3,554

According to Boussingalt, the elements of a first and second crop of clover from an acre of land are, of

	lbs.
Carbon	2,757
Hydrogen	288
Oxygen	2,211
Nitrogen	118
	5,374

SOIL.

The soil best adapted for raising clover is an argillaceous one; a clayey loam, and one in which lime and other alkaline earths are present. Any soil that may be called a good wheat soil is also a good clover soil; because wheat possesses many of the same important ingredients, but not in the same proportion. That the alkalies should be largely in the ascendancy to constitute a good clover soil, we infer from an analyses of the ashes of clover. They contain, according to Professor Horsford,

Potash	16.101
Sodium	1.874
Soda	40.712
Lime	21.914
Magnesia	8.289
Phosphate of iron	.670
Chlorine	2.856
Phosphoric acid	3.915
Sulphuric acid	1.063
Silica	2.606
	100.000

A glance at the above shows that clover is composed of a large proportion of the alkaline earths, as lime, soda, magnesia and potash. It follows that to prepare those ingredients that they may be appropriated by the clover, sulphuric acid must be present, and without it those ingredients could never have been appropriated by the growing plant. After deducting the carbonic acid, carbon and sand, one hundred pounds of the ashes contain nearly as follows:

	lbs.
Potash	16
Soda	40
Magnesia	8
Chlorine	2
Phosphoric acid	4
Sulphuric acid.	1
Silica	2

A little over one-half a ton of clover hay will produce the above. It takes one hundred pounds of clover to make eleven pounds of ashes.

MANURE.

Soils that are light and porous are generally deficient in the mineral materials, and cannot produce clover to advantage unless a proper fertilizer be applied. Ashes contain potash; plaster contains lime and sulphuric acid, and salt contains soda and chlorine. It follows that those articles are proper fertilizers for clover. Besides the inorganic material of clover, it contains starch, sugar, albumen, gluten, &c., which are composed of carbon, oxygen, hydrogen and nitrogen.—These are supplied, in part, from the atmosphere, and may be supplied, in part, by common barn-yard manure, before it has undergone much decomposition.

Plaster applied to clover fixes the ammonia; the sulphuric acid of the plaster disengages itself from the lime and unites with the ammonia, and forms sulphate of ammonia, and holds or fixes it, preventing its escape in the form of gas, till the growing plant appropriates it to itself.

TIME OF CUTTING.

The disagreement among cultivators themselves may be harmonized by a few scientific facts, which cannot be easily overlooked or evaded. The period when clover possesses the greatest amount of nutritious matter is the proper time to cut it. If cut before or after that time, some portion of its nutriment is lost.

An experiment by Professor Horsford fully settles this point. Clover cut on the sixteenth of June, at the surface of the soil, when the heads just began to appear, produced only 0.80 per cent. of sugar. Clover cut on the first of July, when the heads were fully developed, produced 1.15 per ct. of sugar; very near fifty per ct. more than that cut first.

If clover is not cut when sugar is most prevalent, it goes to perfect the seed, and the same loss of nutriment is the result. A little observation of the instincts and habits of the insect tribes will confirm any skeptical person upon this point. Bees and other insects never work upon clover before it blossoms, because sugar has not been elaborated; nor after, because it has gone to support the seed, and is not now sugar. These facts should satisfy any agriculturist as to the proper time to cut clover.

CURING THE HAY.

The water contained in green clover when first cut, amounts to from 75 to 83 per cent. It also contains a certain amount of sugar, which is easily fermented. Therefore when cut and placed in a barn or stack, fermentation will be produced, which will destroy the sugar and other nutritive qualities, and vinegar or acid will be produced, rendering the hay sour and unfit for food. If sufficiently dried, the sugar will remain with the fiber, and the hay will be a nutritious, wholesome food for stock, and supply the animals with, not only food, but an element (carbon) which will generate animal heat.

The whole plant contains 11.18 per cent. of ashes; the leaves 10.69 per ct., and the stems 8.52 per cent. All of the ingredients have more or less of valuable properties to support the animal economy. The leaves contain nearly one-fourth part more than the stem alone. They should be carefully preserved. This can only be done by carefully drying the clover before putting it into the barn. The clover may be cut and permitted to lay in the swath a few hours to wilt. Let it then be carefully put up into bunches, to remain a few days, to cure and partly dry. When it is desired to house it, let the bunches be opened and exposed to the air a few hours, and it is then fit to go to the barn. A little salt may be scattered broadcast over the layers. Never let the hay dry so much in the field as to have the leaves and heads drop off by handling or hauling.

CLOVER AS A FERTILIZER.

	Per cent.
The whole plant	1.83
The leaves	1.75
The stems	1.40

The ashes of clover contain the following per-centage, by which some estimate may be made of its value as a fertilizer:

	Per cent.
Potash	12.164
Sodium	1.414
Soda	30.757
Lime	16.556
Magnesia	6.262
Phosphate of iron	.506
Chlorine	2.159
Phosphoric acid	2.957
Sulphuric acid	.801
Silica	1.968
Carbonic acid	22.930
Sand and coal	1.244

The large quantity of carbonic acid should be considered. It far exceeds the sum of all the other acids, being nearly 23 per ct. of the whole. When green clover is first plowed under, by the action of carbon, heat is evolved and fermentation begins; carbonic acid gas is formed, and passing off forms a chemical combination with the mineral or inorganic elements of the soil, rendering them fit to be assimilated and appropriated by the succeeding crop. That clover is a powerful fertilizer for wheat, and all other crops requiring lime and other alkaline earths, is admitted by most agriculturists; but at what stage of its growth it is best to do it, is yet a matter not fully settled.

Some assert that when clover is full grown it is a positive injury to plow it under; and assign as a reason that such a mass of green substance passes rapidly into a state of fermentation, and becomes so far decomposed as to produce the acetous fermentations; acid is formed before the crop can receive any benefit from the vinous fermentation. They also claim that the clover may be pastured off, and half or more of the mass of herbage be converted into manure, and left upon the soil by the droppings of the stock, and this will be equivalent to any supposed loss of the clover fed off, and a saving so far made of the amount of food taken from the field, and a further saving of the less labor required to turn under a half crop instead of a full one. Those who maintain the opposite theory claim that a full grown crop is best to plow under; assert the fact that the full grown clover containing the largest proportion of sugar, and the largest amount of herbage, it must be best. Now both of these individuals may be right, under certain circumstances, as much depends upon the season. If it be dry it may decompose less rapidly than it would if the converse were true. It will also depend upon what crop is to follow the clover. It is generally believed, upon good authority, that wheat requires a soil in which lime and the alkalies exist in a large proportion. It is also known that clover contains alkalies, or mineral earths, in abundance for any crop, and the carbonic acid of the clover will decompose them. It follows that a clover lay is a good manure for wheat.

SEEDING TO CLOVER.

There are various modes adopted to seed land to clover. Some scatter the straw evenly over the land, and say that ordinarily there is enough seed left after thrashing to seed the land with, and the straw is a benefit to the land and no injury to the wheat. Others prefer to sow the seed in chaff, and say it can be sown more evenly, and assert that the machines in which the seed is cleaned injures a large proportion of seed, and prevents it from vegetating. Others prefer to sow the seed in a clean state. Now all these methods may be good, and each individual must decide for himself as to the mode for him to pursue.

QUANTITY OF SEED.

The quantity of seed to an acre is from 6 to 12 pounds; the latter quantity we think none too much. Two pounds of it may be allowed for imperfect seed. If sown thick the hay will be finer and better, and the seed be more likely to grow, protecting each other.

TIME OF SOWING.

The practice of sowing in the spring is the most followed. Let it be done when there is snow on the ground, if such a thing can be had; it can be sown more evenly.

If we should follow the teachings of nature we should select the fall of the year to sow the seed. If sown early, it will come up and get rooted before winter sets in. If it does not vegetate in the fall it will have the benefit of the fall rains and freezing and thawing to enable it to grow early in the spring. Some few are practicing this course with success. Nature's method is to sow her seeds as soon as they are ripe. They generally vegetate and grow well, and biennial and perennial plants usually get large enough to withstand the winters. This is true with indigenous plants, and how far clover may be acclimated and become as hardy as an indigenous plant, experiment alone can determine.

WITH WHAT SHOULD IT BE SOWN?

It should be sown with some plant that will give it protection. If sown with oats, peas or barley, it is too late, and the dry weather sets in before it gets large enough to survive it, and it frequently cannot vegetate at all. Wheat having already been sown, and its leaves are sufficiently expanded to protect the young clover as soon as up; it is therefore better to sow with wheat, as being the least risk. The wheat is cut in time to give the clover a chance to mature.

SAVING THE SEED.

The old method of mowing the clover and thrashing the seed from the straw is nearly abandoned. Machines have been invented by which the heads are taken from the straw in the field; the heads alone have to be thrashed; the straw remaining in the field as a fertilizer. The first crop is cut for hay, and the second crop is generally allotted for seed. It has a better season of the year to perfect itself, and the farmer more time to attend to it.—*Cotton Planter*.

Why so few Succeed.

Life is a continued battle, in which defeat is suffered more often than victory is won. Along its flinty path the foot-prints of disaster are everywhere seen, and by the wayside are thickly strewed the graves of the fallen. Why is it that so few succeed? Why is the hope with which youth set out so often desolated, and the goal of ambition so rarely reached? The strife is too often commenced without preparation for the struggle. The young, impulsive and ardent think they have but to reach forth their hand to pluck the fruit, that, like the apples of the Hesperides, is only to be gained after the highest endurance and the most patient perseverance. Seldom does genius give the tongue of flame that secures distinction almost without effort. Toilsome study, and persistent investigation, and patient experiment are the only modes of realizing a power to create, or even to recombine, so as to subdue new elements to human use. Physical as well as mental training is necessary for the accomplishment of life-victories. But when the intellect is well cultivated, the bodily energies are often uncultivated. The mind, like friction upon a machine not lubricated, wears out the mechanism of the body, and its growing weakness and disorder nullify the power it envelops. How often a blanched cheek, emaciated limbs, and feeble muscles mark the successful student, who drops into the grave when he is about to reach the goal of his aspirations! We of America have much to learn on this point. A system of intellectual-forcing culture, a habit of putting boys to the business of men, has produced a species of precocity which, however much it may awaken astonishment at the wonderful developments, will leave—nay, has left—manifold evils. At the rate we are now progressing, the time is not far distant when such a thing as boys will be entirely unknown. Now the lads of ten wear the manners of maturity, and the girls of a lesser age are often women in all but physical development. To the want of physical culture there is also to be added a neglect of moral lessons. What school in America teaches "the humanities" as they should be taught? Where is principle laid down as the basis of all good effort? Honourable action, not in the received sense, which is promptitude in resenting any conceived insult or suspected affront, but honourable action, meaning that squared upon the golden rule, "do unto others as you would they should do unto you," inculcated as the highest guaranty of noble results? Our teaching is wrong; our example is wrong; our praise and our censure are often wrong; and the result is that we see fewer of those men, self-made, and strong in rectitude as the eternal truth, firm in principle as the living rock, pure in character as the mountain stream, and vigorous in mind and body as the sturdy oak, who shed honour on our early history.

Hunt's Merchant's Magazine.

Wonderful Power of Fuel.

It is well known to modern engineers, (remarks an English journal,) that there is virtue in a bushel of coal, properly consumed, to raise seventy millions of pounds weight a foot high. This is actually the average effect of an engine working in Huel Towan, Cornwall, England. Let us pause a moment and consider what this is equivalent to in matters of practice. The ascent of Mount Blanc from the valley of Chamouni is considered, and with justice, as the most toilsome feat that a strong man can execute in two days. The combustion of two pounds of coal would place him on the summit.—The Menai bridge, one of the most stupendous works of art that has been raised by man in the modern ages, consists of a mass of iron not less than four millions of pounds in weight, suspended at a medium height of about 120 feet above the level of the sea.—The consumption of seven bushels of coal would suffice to raise it to the place where it hangs. The great pyramid of Egypt is composed of granite. It is seven hundred feet, in the side of its base, and five hundred in perpendicular height, and stands on eleven acres of land. Its weight is therefore 12,700 millions of pounds, at a medium height of 125 feet; consequently, it would be raised by the effort of about 630 chaldrons of coal, a quantity consumed in some foundries in a week. The annual consumption of coal in London is estimated at 1,500,000 chaldrons. The effort of this quantity would suffice to raise a cubical block of marble, 2,200 feet in the side, through a space equal to its own height, or to pile one mountain on another. The Monte Nuovo, near Pozzueli, which was erupted in a single night by volcanic fire, might have been raised by such an effort from a depth of 40,000 feet, or about eight miles. It will be observed that, in the above statement, the inherent power of fuel is, of necessity, greatly under-rated. It is not pretended by engineers that the economy of fuel is yet pushed to its utmost limit, or that the whole effective power is obtained in any application of fire yet devised: so that were we to say 100 millions, instead of 70, we should probably be nearer the truth.—*Maine Farmér.*

Advantages of Trees.

We do not know the author of the following beautiful and comprehensive notice of trees, but we think its perusal will cause many of our readers involuntarily and heartily to respond to the familiar and popular language of the song "Woodman spare that tree" :—

How beautiful, most beautiful of earth's ornaments, are trees! Waving out on the hills and down in the valleys, in wild wood or orchard, or singly by the wayside, God's spirit and benizon seem to us ever present in trees. For their shade and shelter to man and brute; for the music the winds make among their leaves, and the birds in their branches; for the fruits and flowers they bear to delight the palate and the eye, and the fragrance that goes out and upward from them forever, we are worshipful of trees.

"Under his own vine and fig tree" —what more expressive of rest, independence and lordship in the earth! Well may the Arab reverence in the date-palm a God-given source of sustenance. Dear to the Spaniard is the olive, and to the Hindoo his banyan, wherin dwell the families of man, and the birds of heaven build their nests. Without trees what a desert place would be our earth—naked, parched, and hateful to the eye! Yet how many are thoughtless of the use and beauty of trees. How many strike the axe idly or wantonly at their roots. Above all other things in the landscape we would deal gently with trees. Most beautiful where and as God plants them, but beautiful even as planted by the poorest art of man, trees should be protected and preserved.

If he is a benefactor who causes two blades of grass to grow where one grew before, how much greater his beneficence who plants a tree in some waste place, to shelter and shade, to draw thither song birds, and to bear fruit for man. Plant trees, O man, that hast waste land, and be careful of those that are planted.—*Scientific American.*

The Gooseberry.

Elliott says: "The cuttings of the gooseberry should be made of the new wood of the present year—say in August or early in September, or as soon as the season's growth is completed and the wood ripened. The cutting should be about ten inches long, with all the buds on the lower six inches cut out, and the lower end cut square and even immediately underneath the bud. [It is better that each cutting should have left attached to it a portion of the old wood from which it is cut.] Set the cuttings six inches deep, fill up two inches, and tread very firm and compact; the remaining four inches fill in loosely.

Abused Eyes.

Has your horse eyes, Mr. Lovelight? Good ones? How long do you expect to keep them good, shut up in a dark stable? He who made the animal's eye, made light for that eye, and so constituted it as to meet the wants of the eye. Give your horse the benefit of this exact fitness, Mr. Lovelight. The eye for light, and light for the eye. Aside from freedom, do not deprive your domestic animals of the natural blessings to which they are entitled. Give them abundance of light, as well as air and wholesome food. It will be money in your pocket, and show you a merciful man.

Do not ask, "Does God take care of oxen?" but care yourself, as His steward, of the oxen and horses which, from any cause, are under your management, and you will not fail of His blessing. It is not necessary to keep your horses, sheep and cattle in dark stalls and pens, because darkness prevails in your neighbour's barns. Give them a healthful example of light. Recognize the fact that your animals have eyes, and treat them in accordance with it.

Life Illustrated.

Drainage.

The subject of drainage is, very properly, attracting the attention of land-holders in this part of the country. There has been much discussion with regard to the depth at which drains should be laid, and the distances they should be from each other. As an exposition of the principles involved in these points, and as a general illustration of the philosophy of drainage, the following extract from an editorial article in the (London) *Farmers' Magazine*, is worthy of special attention:

We are sometimes told that farmers ought to leave their habits and prejudices at home, and come to the discussion of an agricultural subject, exactly as a lobster would if divested of its shell. Let us see how much a meeting conducted on such terms would be worth. The cultivation of a dark, strong, homogeneous clay, affected entirely by water on its way from the heavens downwards to the sea, and where the principle has been to remove this as quickly as could be effected by open parallel furrows on the surface, a few feet distance only apart, and intersected by parallel open drains, in a cross direction, some 20 or 30 yards asunder. Such a system with one man is the only drainage that he requires to effect his object.

The cultivator from another district, (probably the oolitic), where the soil is a dark, tenacious clay at top, and an open, porous, or absorbent soil below, is satisfied with any depth of drain, provided it is deep enough to penetrate the retentive soil lying above, so as to give the water free admission to the porous sub-soil below. Another, who lives in a district of greatly undulating surface—with a porous sub-soil on extensive or dislocated portions, and intersected at all angles with beds of tenacious clay lying at all depths and thickness—the porous portion supplied and overcharged with water, endeavoring by its own gravity, to force its way through it from the highest to the lowest level, and constantly endeavoring to escape upwards from its disposition to find a level, or rising to the surface by capillary attraction whenever the disintegrated particles rest on quicksands below, already highly charged with water—the resident in such a district says nothing but *deep*-draining will answer, the *distance* apart being only secondary; but nothing less than four-feet drains, and in many instances even twice that depth, will suffice to rid the sub-soil of its injurious occupant.

Again, we have the farmer from a country where one uniform flat surface prevails, and regularity of sub-soil, are each of themselves equally remarkable features; and he requires drains as near to each other, in point of distance, as can be effected—6 yards apart at most and from 26 to 36 inches in depth, running parallel to each other throughout the whole field. This mode he has found to answer his purpose; and he has no doubt will equally answer for every one else.

And thus might we multiply instances without end. But as a few invariable and unerring principles are connected with the subject, we will endeavor to record them.

1st. The specific gravity of water is 817 times heavier than air.

2d. By its gravity it always has a disposition to descend; but the instant it meets with resistance, it exerts its force equally in every other direction.

3d. That force is invariably exerted until it has found a level, and it can then only be said to be at rest.

4th. That whenever this equilibrium is attained, it remains in that state (stagnant) until disturbed.

5th. That in perforating the soil with a drain, that portion nearest the drain is first set in motion, and this is followed in successive rotation by the next nearest portion, and so on to the extent of its action.

6th. That its action ceases whenever the compactness of the soil is sufficient to overcome the gravity of the water held by it in suspension.

7th. That water not only descends by its specific gravity, but ascends by capillary action; wherever the lower portion of the soil rests in water, the complete disintegration of its particles facilitate that object.

8th. That water passing from a higher to a lower level through the soil, always has a tendency to rise to the surface, and would invariably do so unless intercepted by open or underground drains—hence the origin of springs.

9th. Water, on reaching the surface of the earth, would continue to descend in the soil until resisted, which it invariably would be whenever a porous soil was preceded by a retentive one.

10th. That water in its purest state, as rain water, is slightly charged with ammonia; but to an inconsiderable extent, excepting after long seasons of drought.

11th. That water becoming stagnant in a soil, becomes deleterious to plants growing upon the surface, the mineral deposits, especially iron, after entering into its composition, rising towards the surface.

12th. That water passing through a hollow pipe meets with resistance produced by friction. A pipe filled at one end cannot be made to run full at the other.

13th. That water in a drain, upon meeting with resistance, will fill it continuously upwards until the weight of the column of water overcomes such resistance by the pipes giving way at the lowest point.

14th. That the velocity with which the drains discharge themselves depends upon their inclination and the permeability of the soil.

15th. The specific gravity of water being greater than that of air, it invariably displaces the latter in the soil; but upon its removal, air again occupies the space originally held by it, and thus a continuous action is produced in the soil.

16th. Water when frozen expands, and thus by its power, the hardest substance becomes broken up, or have their external surfaces abraded by its action.

The foregoing is merely a statement of those principles which will ever be coming into operation during the process of draining; and by observing which the operator can seldom err. Of all scientific practices, that of draining is of itself the simplest of application; the merely perforating the subsoil with a hollow drain, at a sufficient depth must necessarily draw off the accumulation of water held in suspension in the adjacent soil. If this be tenacious, from thirty to thirty-six inches will in most cases be sufficient, keeping in mind that, although a greater depth might be desirable, the cost of the drainage ought always to govern the proceeding. On the contrary, if the subsoil is porous and charged with water flowing from a higher level, then the drains must be sufficiently deep to carry off the water, that the soil near the surface may not be rendered wet by capillary action, bearing in mind that the more complete and minute the disintegration of the soil, the greater the disposition of the water from below to ascend towards the surface. In some cases drains from 40 to 50 inches will be requisite.

In soils alternating in quick succession of beds of gravel, sand, and clay, a few deep drains judiciously placed will generally effect the drainage of large portions of a field, remembering that the drain should always be cut so as to intercept the water passing in the gravel or sand before it reaches the clay, and in a parallel direction with the edge of the deposit. In some cases the merely perforating the clay in one continuous line from one gravel bed to another to the lowest level, will also equally well effect the object. The drains must invariably be deep enough to release the gravel altogether, and a previous knowledge of their extent and situation ought to be ascertained.—*Boston Cultivator.*

The Annual Yield of Nitrogen Per Acre in Different Crops.

BY J. B. LAWES, F.R.S., F.C.S., AND J. H. GILBERT, PH.D., F.C.S.

[*Read at the British Association for the advancement of Science, Leeds. Section B., September 28th,* 1858.]

ABSTRACT.

In a paper given last year at the Dublin meeting, on the question of the Assimilation of Free Nitrogen by Plants, and some allied points, the authors had stated in general terms, that the amount of nitrogen yielded per acre, per annum, in different crops—even when unmanured—was considerably beyond that annually coming down, in the forms of ammonia and nitric acid, in the yet measured and analyzed aqueous deposits from the atmosphere. The investigations then referred to were still in progress; and a desirable introduction to the record of the results would obviously be to illustrate by reference to direct experiment that which had been before only assumed regarding the yield of nitrogen in our different crops. To this end, had been determined the annual produce of nitrogen per acre, in the case of various crops, which were respectively grown for many years consecutively on the same land, namely, wheat fourteen years, barley six years, meadow hay three years, clover three years out of four, beans eleven years, and turnips eight years. In the majority of the instances referred to, the yield of

nitrogen had been estimated, both for the crop grown without manure of any kind, and for that with purely mineral manure—that is, excluding any artificial supply of nitrogen. It was the object of the present communication to give a summary view of some of the facts thus brought to light.

Beans and clover were shown to yield several times as much nitrogen per acre as wheat or barley. Yet the growth of the leguminous crops, *carrying off* so much nitrogen as they did, was still one of the best preparations for the growth of wheat; whilst *fallow* (an important effect of which was the accumulation within the soil of the available nitrogen of two years into one,) and *adding nitrogenous manures*, had, each, much the same effect in increasing the produce of the cereal crops.

Other experimental results were adduced, which illustrated the fact that four years of wheat, alternated with *fallow*, had given as much nitrogen in the eight years as eight crops of wheat grown consecutively. Again, four crops of wheat, grown in alternation with *beans*, had given nearly the same amount of nitrogen per acre as the four crops grown in alternation with fallow; consequently, also much about the same as the eight crops of wheat grown consecutively. In the case of the alternation with *beans* therefore, the whole of the nitrogen obtained in the beans themselves was over and above that which was obtained during the same series of years in wheat alone—whether it was grown consecutively or in alternation with fallow.

Interesting questions arose, therefore, as to the varying sources, or powers of accumulation, of nitrogen in the case of crops so characteristically differing from one another as those above referred to.

It had been found, that the leguminous crops which yielded in their produce such a comparatively large amount of nitrogen, over a given area of land, were not specially benefited by the direct application of the more purely nitrogenous manures. The cereal crops, on the other hand, whose acreage yield of nitrogen under equal circumstances was comparatively so small, were very much increased by the use of direct nitrogenous manures. But it was found that, over a series of years, only about 4-10ths of the nitrogen annually supplied in manure for wheat or barley (in the form of ammonia-salt or nitrates) were recovered in the immediate increase of crop. Was any considerable proportion of the unrecovered amount drained away and lost? Was the supplied nitrogenous compound transformed in the soil, and nitrogen in some form evaporated? Did a portion remain in some fixed and unavailable state of combination in the soil? Was ammonia, or free nitrogen, given off during the growth of the plant? Or, how far was there an unfavourable distribution, and state of combination, within the soil, of the nitrogenous matters applied directly for the cereal crops—those, such as the leguminous crops, which assimilated so much more, gathering with greater facility, and from a different area of soil, and leaving a sufficient available nitrogenous residue within the range of collection of a succeeding cereal crop? These questions, among others which their solution more or less involved, required further elucidation before some of the most prominent of agricultural facts could be satisfactorily explained.

Comparing the amount of nitrogen yielded in the different crops, when grown without nitrogenous manures as above referred to, with the amount falling in the measured aqueous deposits, as ammonia and nitric-acid, it appeared, taking the average result of the analysis of three years' rain, that all the crops yielded considerably more, and some very much more, than so came down to the soil. The same was the case when several of the crops had been grown in an ordinary rotation with one another, but without manure, through two or three successive courses. Was this observed excess in the yield over the yet measured source at all materially due merely to exhaustion of previously accumulated nitrogenous compounds within the soil? Was it probably attributable chiefly to the absorption of ammonia or nitric-acid from the air, by the plant itself or by the soil? Was there any notable *formation* of ammonia or nitric-acid, from the free nitrogen of the atmosphere? or, did plants generally, or some in particular, assimilate this free nitrogen?

As already intimated, some of the points which had been alluded to, were at the present time under investigation; the authors having, in this, the able assistance of Dr. Pugh. Others, it might be hoped, would receive elucidation in the course of time. There of course still remained the wider question of the original source, and of the distribution and circulation, of *combined nitrogen*, in the soil, in animal and vegetable life on the earth's surface, and in the atmosphere above it.—*The British Farmers' Magazine*.

Night Air.

During the months of September and October, throughout the United States, wherever there are chills, and fever and ague, intermittents, or the more deadly forms of fever, it is a pernicious, and even dangerous practice, to sleep with the outer doors and windows open; because miasm, marsh emanations, the product of decaying vegetation—all of which are different terms, expressing the same thing—is made so light by heat, that it ascends at once towards the upper portion of atmospheric space, and is not breathed during the heat of the day, but the cool nights of the Fall of the year condense it, make it heavy, and it settles on the ground, is breathed into the lungs, incorporated into the blood, and if in its concentrated form, as in certain localities near Rome, it causes sickness and death within a few hours. The plagues which devastated Eastern countries in earlier ages, were caused by the concentrated emanations from marshy localities, or districts of decaying vegetation; and the common observation of the higher class of people was, that those who occupied the upper stories, not even coming down stairs for market supplies, but drew them up by ropes attached to baskets, had entire immunity from disease, for two reasons, the higher the abode, the less compact is the deadly atmosphere, besides, the higher rooms in a house, in summer, are the warmer ones, and the miasm less concentrated. The lower rooms are colder, making the air more dense. So, by keeping all outer doors and windows closed, especially the lower ones, the building is less cool and comfortable, but it excludes the infectious air, while its warmth sends what enters through the crevices immediately to the ceilings of the rooms where it congregates, and is not breathed; hence is it that men who entered the bar-room and dining saloons of the National Hotel, remaining but a few brief hours, were attacked with the National Hotel disease, while ladies who occupied upper rooms, where constant fires were burning, escaped attack, although remaining in the house for weeks at a time. It was for the same reason that Dr. Rush was accustomed to advise families in the summer time, not being able to leave the city, to cause their younger children especially, to spend their time above stairs. We have spent a life-time ourselves in the West and extreme South, and know in our own person, and as to those who had firmness to follow our recommendation, that whole families will escape all the forms of Fall fevers who will have bright fires kindled at sunrise and sunset in the family room. But it is too plain a prescription to secure observance in more than one family in one thousand. After the third frost, and until the Fall of the next year, it is an important means of health for persons to sleep with an outer door or window partly open, having the bed in such a position as to be protected from a draught of air. We advise that no person should go to work or take exercise in the morning on an empty stomach; but if it is stimulated to action by a cup of coffee, or a crust of bread, or apple, or orange, exercise can be taken, not only with impunity, but to high advantage in all chill and fever localities.—*Hall's Journal of Health*.

From the Ohio Cultivator.

Transplanting Forest Evergreens.

FRIEND HARRIS:—The taste and character of a people is manifest in the appearance of their homes. And in turn, the character of the homes of a country have a powerful influence on the character and taste of the inhabitants. Who ever knew a well appointed home, beautified with the rich adornments which nature so bountifully affords, to turn out an awkward, uncouth youth?

Fearing that an article in the last number of the *Cultivator* may discourage some from transplanting evergreens from the forest, I submit a little practical experience. I have about my premises a number of White Pine and Cedar, and some Hemlock, brought from dense forests on the margin of a stream, out of the sandy, gravelly soil they delight in, and set in strong limestone loam, with tenacious clay subsoil, living and flourishing. Bro. James has them also growing in his yard, and while a boy at my father's, I set out Cedar and Hemlock that have attained considerable size, and are beautiful, dense trees. The rationale and modus operandi are very simple.

The great difficulty in successfully transplanting Evergreens, is the extreme tenderness of the wood. If the earth is removed from the roots, it is almost sure to break off with it the small fibres or spongioles through which the tree receives its nutriment. The great desideratum, then, is to keep the earth about the roots as near in place as possible. Dig the holes to receive the trees, say four to six feet in diameter, and two to three feet deep.. Fill them up within eighteen inches of the top, mingling with the earth a considerable portion of gravel or stones, twigs, leaves, etc. Then take the wagon and one or two good hands, and if you have to go five or ten miles for the trees, start early, so that you need not be hurried. When you get to the woods, remember that if you carelessly take up a dozen trees and they die, you not only lose your time and labor, but are responsible for discouraging yourselves and neighbors; while, if you transplant half the number with care and skill, and they live, your labor could scarcely be expended more profitably, as you not only increase the enjoyment of your own families, and every one who visits you, but add hundreds of dollars to the price of your property, in case of its sale.

Dig a trench around the tree far enough from it to not mangle the roots, and when satisfied you are below the level of the roots, undermine it till it is loose. Then slip a board under, and work the tree gradually on to it, till one can get hold of each end, and so carry it and place it nicely in the wagon. After arranging the trees all in the wagon, throw in a considerable amount of dirt taken from where the trees grew; this will help to keep the earth attached to the roots in place, and be excellent to put about the trees in setting them out. As you put the dirt about the roots, keep throwing in water to settle it closely around them. Plant the tree about the same depth it grew in the woods, but leave the hole in which it is set, unfilled, say four to six inches below the surface of the ground, in order that it may collect moisture and hold the mulching. Mulch it with pine twigs and leaves brought from the woods. In this way I transplant Evergreens from the forest, from one to four inches in diameter, and though some die, enough live to compensate tenfold for the trouble. WM. H. LADD.

Never speak evil of your neighbour.

From Hunt's Merchants' Magazine.

Human Hair as an Article of Trade.

Few persons are probably aware of the extent to which the traffic in human hair is carried. It has been ascertained that the London hair-merchants alone import annually no less a quantity than five tons. But the market would be very inadequately supplied if dependence were solely placed on chance clippings. There must be a regular harvest, which can be looked forward to at a particular time; and as there are different markets for black tea and green tea, for pale brandy and brown brandy, so is there a light-haired market distinct from the dark-haired.

The light hair is exclusively a German product. It is collected by the agents of a Dutch company who visit England yearly for orders. Until about fifty years ago, light hair was esteemed above all others. One peculiar golden tint was so supremely prized, that dealers only produced it to favourite customers, to whom it was sold at eight shillings an ounce, or nearly double the price of silver. The rich and silk-like texture of this treasured article had its attractions for poets and artists as well as traders. "Shakespeare especially," says one of our authorities, "seems to have delighted in golden hair." "Her sunny locks hung on her temples like the golden fleece;" so Bassanio describes Portia in the *Merchant of Venice.* Again, in the *Two Gentlemen of Verona,* Julia says of Sylvia and herself: "Her hair is auburn, mine is perfect yellow." . . . . . . Black hair he only mentions twice throughout his entire plays, clearly showing that he imagined light hair to be the peculiar attribute of soft and delicate women.

A similar partiality for this colour, touched with the sun, runs, however, through the great majority of the poets, old Homer himself for one; and the best painters have seized, with the same instinct, upon golden tresses. A walk through any gallery of old masters will instantly settle this point. There is not a single female head in the National Gallery, beginning with those glorious studies of heads, the highest ideal of female beauty by such an idealist as Correggio, and ending with the full-blown blondes of the prodigal Rubens—there is not a single black-haired female head amongst them.

But all this has passed away; the dark brown hair of France now rules the market. It is the opinion of those who have the best right to offer one on such a subject, that the colour of the hair of the English people has deepened in tint within the last fifty years, and that this change is owing to the more frequent intermarriages, since the Napoleonic wars, with nations nearer to the sunny South. Whether dark or light, however, the hair purchased by the dealer is so closely scrutinized, that he can discriminate between German and the French article by the smell alone; nay, he even claims the power, "when his nose is in," of distinguishing accurately between the English, the Welsh, the Irish, and the Scotch commodities. The French dealers are said to be able to detect the difference between the hair "raised" in two districts of Central France, not many miles apart, by tokens so slight as would baffle the most learned of our naturalists and physiologists.

Black hair is imported chiefly from Brittany and the South of France, where it is annually collected by the agents of a few wholesale Parisian houses. The average crops—we scorn the imputation of a pun—harvested by these firms, amount yearly to upwards of two hundred thousand pounds weight. The price paid for each head of hair ranges from one to five francs, according to its weight and beauty; the former seldom rising above a pound, and seldom falling below twelve ounces. The itinerant dealers are always provided with an extensive assortment of ribbons, silks, laces, haberdashery, and cheap jewelry of various kinds, with which they make their purchases as frequently as with money. They attend all the fairs and merrymakings within their circuit, and the singularity and novelty of their operations are wont to strike travellers more than anything else which meets their notice. "In various parts of the motley crowd," says one who had stopped to stare his fill at one of the Breton fairs, "there were three or four different purchasers of this commodity, who travel the country for the purpose of attending the fairs, and buying the tresses of the peasant girls," who seem, indeed, to bring the article to market as regularly as peas or cabbages. "They have particularly fine hair," he continues, "and frequently in the greatest abundance. I should have thought that female vanity would have effectually prevented such a traffic as this being carried to any extent. But there seemed to be no dfficulty in finding possessors of beautiful heads of hair perfectly willing to sell. We saw several girls sheared, one after the other, like sheep, and as many more standing ready for the shears, with their caps in their hands, and their long hair combed out and hanging down to their waists. Some of the operators were men, some women. By the side of the dealers was placed a large basket, into which every successive crop of hair, tied up into a wisp by itself, was thrown." As far as personal beauty is concerned, the girls do not lose much by losing their hair; for it is the fashion in Brittany to wear a close cap, which entirely prevents any part of the *chevelure* from being seen, and of course as totally conceals the want of it. The hair thus obtained is transmitted to the wholesale houses, by whom it is dressed, sorted, and sold to the hair-workers in the chief towns, at about ten francs per pound. The portion of the crop most suitable for perukes is purchased by a particular class of persons, by whom it is cleaned, curled, prepared to a certain stage, and sold to the perukeiers at a greatly advanced price—it may be forty, or it may be eighty francs per pound. Choice heads of hair, like choice old pictures, or choice old china, have, however, no limit to the price they may occasionally command.

From Hunt's Merchants' Magazine.

Vegetable and Truck Trade of Norfolk, Virginia.

The accurate and accomplished clerk of the Merchants and Mechanics' Exchange has extracted from the shipping lists of the various steamers, and other authentic sources, the number of barrels, boxes, and baskets of peas, cucumbers, beans, tomatoes, radishes, rhubarb, asparagus, apples, pears, peaches, &c., &c., and below we give the total exports to each market during the months of June, July and August:—

	Packages.	Value.
New York	52.301	$183.053 50
Philadelphia	7,305	25,567 50
Baltimore	67,424	235,984 00
Richmond	1,565	5,477 50
Total,	128.595	$450,082 50

The above packages are estimated at

$3 50, which is a low figure, as the largest portion of the packages were barrels of cucumbers, radishes, potatoes, &c., which, in the early part of the season, commanded $6 to $10 each.

The above statement shows a very large amount shipped to Baltimore, and it is proper to remark that much of it went through to Philadelphia, Washington, and even as far as Cincinnati, via the former city. In addition to the above, there have been from 75,000 to 100,000 water-melons shipped hence to Northern ports during the season. It will be seen, by comparing the foregoing statement with that made last year, that this trade is very rapidly increasing. The total quantity shipped last year, was 96,099 packages, valued at $336,346 50; we have, therefore, an increase this year in quantity of 32,496 packages, and in value of $113,736.

Merchandise exported from the Port of Norfolk during the month of September, 1858, *as reported on the Books of the Merchants and Mechanics' Exchange.*

COASTWISE.

		Quantity.	Value.
Apples, dried,	bush.	1,892	$3,845
Apple brandy	bbls.	39	1,287
Corn	bush.	43,164	33,867
Cotton	bales	288	14,400
Fish	bbls.	109	436
Flaxseed	bush.	896	1,593
Flour	bbls.	75	475
Peaches, dried	bush.	192	1,356
Peas	bush.	76	112
Rosin	bbls.	148	508
Tar	bbls.	613	1,379
Staves	No.	40,000	1,800
Shingles	No.	903,750	4,391
Spirits turpentine	bbs.	24	74
Wheat	bush.	17,519	20,131
Total			$85,454

FOREIGN.

Beef	bbls.	24	$312
Railroad cross-ties	No.	2,934	1,173
Staves	No.	620,837	19,008
Splice blocks	No.	1,000	500
Total			$20,993
Grand total			106,447

Reflections on Vegetable Physiology.

BY YARDLY TAYLOR, OF VA.

The perfection of ancient philosophy was held to consist in the abstraction of the mind from material objects, and thus, by leaving it free from earthly influences, was supposed to be the only way to obtain true wisdom. This, by leading men to consider the things of this world as beneath their notice and investigation, was well calculated to retard the advancement of true science and of even their earthly interests. Man is a social being, connected with the things of time and sense in such a way, that his true interests lie in giving to each the attention they deserve. In the revival of learning, after what was called "the dark ages," it was too often the practice of philosophers, to advance theories for the operations of nature, partly founded on investigation, and partly on conjecture. Indeed it could hardly be otherwise; for the laws that govern the operations of nature in many instances, are yet but imperfectly understood. Theories once considered correct are now found to be erroneous, and every true advance in science, tends to explain something hitherto conjectural.

It is not living in an enlightened age, that make sus enlightened, but by living up to enlightened principles.

It is much easier to take things on hearsay, than to acquire knowledge by investigation; hence, there are often, in this day, theories put forth by writers on scientific subjects not in accordance with facts.—When it was ascertained, that matter for vegetable growth, was imbibed by the roots and carried up by the ascending sap, as well as imbibed by the leaves, and the importance of sun light to vegetation became known, the theory of the circulation of the blood in the animal economy, was considered as a type of the circulation of the sap in vegetables. Hence it was thought, that an upward flow of sap through the sap wood, was designed to carry the matter for growth to the leaves, where it was spread out to the action of sun light, and thus prepared for assimilation by the plant, then carried by a downward flow of sap between the bark and wood, and deposited for growth. But now, botanical writers reject the theory of any downward flow of sap at all, and maintain that, considering the great amount of water thrown off by evaporation from the leaves, there is ample ground for believing, that materials enough for growth may be imbibed by the sap and by the leaves in the form of carbonic acid gas, and that the decomposition of the latter gas, will furnish the carbon of the plant. And, were they to admit the principle of electricity, as the principal agent in decomposing this gas, they would most probably have a theory much nearer to the real facts of the case than any other yet offered to the consideration of the enquiring mind. (See, *New American Encyclopedia*, article, *Botany*.)

Many curious phenomena may be observed by the investigator in vegetable growth, and some of these have been designated as "vegetable instinct." A late writer in a periodical enumerates some of these peculiarities, such as the habit of a plant growing in the direction of water; that of convolvulus, or scarlet runner, reaching towards an upright support to sustain itself, and its coiling round only one way; and then goes on to say, "yet, notwithstanding, if two of those plants grow near each other, and have no stake around which they can entwine, one of them will alter the direction of its spiral, and they will twine round each other." Now this is entirely a mistake, and can only have been made without examining into the nature of the case. What need is there of its altering its spiral to attain its purpose? None in the world, and it would only encounter more difficulty. Nothing is easier than for two twining plants, to twine round each other; it is often seen in gardens; but then they always twine the same way, never otherwise, unless force is used. Let a person attempt to twist two strings together in opposite directions, and he will find himself foiled in the attempt and see the awkwardness of the undertaking. Nature never works awkwardly.

Different plants have different habits in this respect, but then the habit of each class of plants is the same without variation. Different varieties of convolvulus, lima and other beans, twine round from East by North and West and South, in ascending, while the hop vine and honeysuckle twine round the other way; that is from East by South to West and North. The tendrils of vines, such as grape vines, the ground tribe, &c., exhibit some curious phenomena. They are often several inches in length, and if, in reaching forth, they come in contact with any support near their extremity, they soon clasp it, by twining round it in the direction of the habit of the plant, and thus fix themselves. The remainder of each tendril between the vine and support then assumes a spiral form like a corkscrew, and in doing so, as both ends are secure, the spiral, from about the middle, is turned each way, just as if we fastened a string forming a loop with both ends tied to a stick, and then, by taking the middle of each loop and wrapping the string round the stick, each end would be wrapped in a different direction; that end nearest the vine being strongest, retains the direction of the habit of the plant, while the weaker part has to give up its natural direction, but will assume the spiral form, however, as completely as the other, but only by force.

The habit of the roots of trees, vines, &c., increasing faster in the direction of water, has been supposed to belong to that undefinable law "vegetable instinct," a law that may be called in whenever we can assign no known law for an effect produced. But is there no known law, to account for this effect?

Scientific botanists, now, all acknowledge increase of growth to be by the addition of of cellular matter, furnished the plant in sap, and containing the materials for growth. This cellular matter will be more abundant where water could dissolve more of it from the soil; hence the roots will increase faster where water and its other proper nutriment are most plenty, and increase in that direction. But there is another law of matter that here comes in and plays a most beautful part in this connection—the law of capillary attraction. The earth being a porous substance, the water ascends by capillary attraction, whenever the surface above becomes dry. Hence the earth in the vicinity of water beneath it, is more moist in a dry time than that in other places. Thus the roots extend more rapidly, because there is more materials for growth in that direction than in others. This is just what we might expect; a natural result from well known causes. Roots of trees have penetrated six or seven feet deep into the ground, and stopped up an underdrain for the conveyance of water. They have been known to descend 30 or 40 feet deep into wells to the surface of the water there. I have seen the roots of a willow tree, where it penetrated a pipe made of hydraulic cement through an opening not larger than a fine knitting needle, and after reaching the inside, there enlarging and branching until it nearly choked up the pipe and stopped the water. The power of capillary attraction, exerted by water in entering the roots of trees and plants is enormous. It is a powerful means of breaking up the rocky matters near the earth's surface, and thus forming soil.

The habit of the sunflower opening its broad disk of petals towards the morning sun, is another fact attributed to "vegetable instinct." Here again we see laws of matter, that are calculated to produce this effect. The young stalk with its head containing the embryo flower, is at first, like all young thirfty growing plants full of sap, with its carbon or woody fibre very tender. In the morning, when the dews of the night have prevented much evaporation from the leaves of the plant, its tissues are distended with sap and thus braced upward on every side; but after the rising of the sun, its rays strike the plant on the eastern side, and causes the evaporation of the dew from that side first, by warming the bark of the plant on that side and evaporating the juices there, before the dew is driven off from the opposite side. The difference in temperature between the sunny and the shaded sides of the plant is, early in the morning, considerable, while, in the after part of the day it is much less. Hence the tissues of the plant being relieved from distention on one side, even for a few hours, give a leaning direction that way, and, as this is repeated every day, and the increasing weight of the plant is added, a permanent position is given to the plant as it hardens in growth. The flexibility of young growing plants, is very conspicuous in the growth of the young fruit of the crooked-neck squash. The young fruit when the flower drops off, is slender and two or three inches long, and as the stem end is fixed somewhat permanent, the elongation of the fruit must be by pushing the blossom end forward; and when the space for this has no obstruction, the fruit grows straight, but if any obstruction interfers with it, and stops this movement, the young fruit bends sideways as it must grow, and often turns the blossom end of the fruit completely round towards the stem of the plan, thus forming a semi-circle.

The laws of vegetable physiology in the growth of plants, are well calculated to interest the enquiring mind. Their simplicity and adaptedness to the end proposed, give indubitable evidence of wisdom and design. It is seen that, by these operations, the otherwise inert matters of the earth and air, are converted into plants and fruits, and thus these matters are prepared to sustain animal life, which they could not do without this conversion. And then again, animals in giving off carbonic acid gas by breathing, furnish that gas to growing plants. This completes a circle of results, apparently of boundless extent, for the more vegetable growth is produced to sustain animal life, the greater quantity of carbonic acid gas is given off in supporting vegetable growth. It is hard to say, where the limit of this increase in both kingdoms is to be seen; we know but little of what the earth may be made to produce, or the amount of animal life that may be supported from a given space. It should be the part of Scientific agriculture, to investigate the conditions necessary to produce heavy crops, not by theories of science merely, but by careful study of soils and manures and the conditions under which heavy crops have been grown. The difference in soils, and the different application of manures to suit those differences, give ample scope for the exercise of the ablest talent.

It has been too much the practice of mankind to look up to deeds of daring and boldness, as the ennobling acts of individuals, when, if we could see the workings of their minds in moments of reflection and composure, we might come to a very different conclusion. It has been said with a good deal of truth, and a truth that will be more and more acknowledged as agriculture improves, that the statue of Washington in the Capitol at Richmond, that represents him in the costume of a farmer with the sword laid aside, and the emblems of agriculture around him, presents him in a far more dignified and noble aspect than any statue of him with military appendages. It is to be hoped that this feeling will more and more abound, and thus by the improvement in agriculture and the arts of peace, a restraining influence on war will be exerted, and cause man to be the friend of man.

American Farmer.

From the Germantown Telegraph.

The Cut Worm.

Dear Major—In conversation a few days ago with an old farmer, he made the following statement in regard to the ravages of the cut worm. He said: "Last year I had a field of corn much injured by their depredations, and tried this experiment. I obtained a number of pieces of common elder, about a foot long, and distributed them over the field two or three yards apart in every third row. On examining the elder branches every morning, I found numbers of worms collected under them; in some instances as many as fifteen or twenty; when they were easily destroyed. The elder seemed to have the property of attracting them." As this is a simple remedy, and the time is now at hand for planting corn, it is worthy a trial. This may be generally known, but if there be any virtue in it, the repetition will do no harm. Truly yours, J. H. S.

Rain Water—Under-Drains, Etc.

The following article is full of useful truths, but the writer in enumerating the sources from whence the soil receives water, has failed to notice that portion received from dews and from condensation upon the surface of cold particles, from the atmosphere circulating in the soil. The fact that the surface evaporation of water reduces the temperature of soils, and that such loss is prevented by under-draining, is fully proved. The loss of ammonia and nitric acid by drainage water is, however, over-stated, as when the drains are sufficiently deep, the loss of these ingredients is no greater than would occur in undrained lands by the same ingredients sinking below the level of roots, while in the drained lands the reception of nitric acid and ammonia from the atmosphere, is increased much more than equal to the quantity parted with by the water.—*Working Farmer.*

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Whatever be the sources of the influence exerted by the rain upon the soil, it is only as the soil enables it to reach the roots of plants that it can act for good. Let us, therefore, consider the means of its access to the plants growing on the soil.

Water can get into the soil in three ways. 1st, as rain falling directly on its surface; 2d, as in the case of spring-water rising from below, where there is a direct connection between the soil and a reservoir at a higher level; 3d, by that surface attraction of matter for it, which, as exhibited by porous substances on water lying beneath them is called capillary attraction. And it is plain that any attempt to drain a field must be guided by all three of these considerations. The quantity of the rain-fall, added possibly to an additional supply from beneath, and both held with more or less tenacity by capillary attraction within the soil, is the agent which you wish by means of drainage, we will not say to get rid of, but to direct to useful ends in the growth of your plants.

Again—water can leave the soil in three different ways; 1st, by running over its surface; 2d, by evaporation from its surface; 3d, by percolation through its substance.—And let us consider what the water does and does not do when escaping from the land in each of these several ways.

1. In the first, when running over the surface of the land, it is of course inoperative. It is wanted to dissolve food out of the soil and feed the plants upon it. It is wanted to bring its own supplies, such as they are, from the air for the nourishment of these plants. It is wanted to break up and comminute the soil by its passage through it. It is wanted for the sake of its own dissolved oxygen and carbonic acid, as well as for the same ingredients in the atmospheric air which follows it in its passage downwards, both of these substances acting usefully in the laboratory of the soil. And it is wanted especially in the spring time for the sake of the temperature of the spring showers, which, if they could get into the land, would warm it. None of these things can it do. It runs off the surface without penetrating it, and its influence as well as want of influence are shown in the case, which often happens, of rain water falling on a frozen field. If it could gain access to the substance of the soil the whole furrow slice would at once be thawed, and we should have vegetable growth recommencing earlier. If it could make its escape through the soil instead of over it, we should avoid those surface currents which wash the finer particles into the furrows and the ditches. The *fertilizing* influence of a *constant* surface current seen in the water meadows is perfectly consistent with the mischievous influence of the state of things with its occasional surface currents seen in every undrained field. The former co-exists along with an escape of water through the soil, for a constant drainage is as necessary as a constant water supply to successful irrigation.

2. But let us now consider what the water does during its escape by evaporation.—In the first place, it is worth while remembering as being among the comparatively indefinite results of evaporation from the surface of the soil, that in this way great loss ensues of the nutritive substances which the water held in solution. It is very true that some theorists contend for what they call the leaf-feeding of plants, and urge that all the benefits of cultivation during the growth of

plants arise from the extension of this evaporation, by which the leaves of the growing plants thus obtain a more abundant supply of food; but we believe that our object in cultivation should rather be to increase the stores of food within the soil, and that tillage operations have this tendency by increasing the quantity of absorbent surface within the soil which is exposed to the air.

The principal result however of the loss of water by evaporation is indicated by the fact that during the conversion of every pound of it into vapor, as much heat is consumed and lost as would be produced by burning 2 or 3 ounces of coal; and when you think that an ordinary rain-fall amounts to 3,000 tons per acre per annum, you can easily conceive that the loss of heat by the evaporation of a comparatively inconsiderable portion of this must involve a great cooling of the land. If 30 inches of rain were evaporated in this way, it would need 1 cwt. of coal per hour per acre through the year to make good the loss of heat sustained in this way; a quantity which, in Dr. Arnott's hands, would give us an Italian climate.—The quantity however actually lost by evaporation is of course nothing like this; a great deal of water finds its way through the land. The water supply of all our springs and wells, if that were known, would indicate its quantity for the island. A great deal escapes in flood times by running over the surface, and a great deal now finds its way out of drains after percolation through the soil. Notwithstanding these causes, however, and notwithstanding the extremely irregular character of the rain-fall, the loss by evaporation must be very considerable. Dalton measured the quantity of water escaping from two rain gauges, one of an ordinary kind, and the other filled 3 feet deep with earth, and he found that of 33 inches of rain which fell per annum as indicated by the one, only 8½ passed through that quantity of earth as indicated by the other, and he concluded therefore that the difference between the two—25 inches, or three-quarters of the whole annual fall—escaped by evaporation.

Mr. Dickinson, of Abbot's Hill, near Kings Langley, has for several years copied Dalton's experiments, with results somewhat different from his; finding that of 26 inches per annum, 15 were evaporated, while as much as 11, rather more than two-fifths of the annual rain-fall, passed through the soil. His results, however, probably exaggerated the quantity of the rain-fall which in general passes through the land, for it is plain that earth loosely placed in Dalton's gauge is much more likely to transmit the rain which falls upon it than the same depth of earth can be in ordinary circumstances, the lower half at least never having been disturbed since the Deluge. And in fact the attempt of Mr. Milne Home to ascertain the truth upon this point, by measuring the water actually escaping from the mouths of drains in a field of a given extent (though it on the other hand was liable to an opposite error because it could not take account of what went through the land altogether to feed the wells and springs of the neighborhood) leads to the conclusion that a much less quantity of water than either Dickinson or Dalton indicates, passes through the land in the course of the year. And it would appear from this that the loss of water by evaporation even in well-drained soils is considerable, and therefore that the loss of heat by evaporation is to a great extent unavoidable.

3. Let us now, however, consider what water does by percolation; and its effects here we must do little more than enumerate. They are shortly these; it carries the temperature of the air into the soil, a thing the possible injury of which, as in autumn and winter when the air is colder than the soil, is as nothing compared with the benefit of it in spring when the air is warmer than the soil and when the advantages of early growth are great. The most important experiments which we know, proving the influence of drainage on the temperature, are those described by Mr. Stephens in his exceedingly instructive little book descriptive of the Marquis of Tweeddale's operations at Yester Mains, where, the temperature of soil being 48 deg. in its undrained state, the cutting of a drain near it and the setting in of a current through it, raised its temperature 1½ deg. in six hours.

Another effect of water percolating through the land is seen in the introduction to it of the atmospheric elements which it holds in solution. The carbonic acid by its operation on the alkalies and alkaline earths is a powerful solvent and disintegrator, and the oxygen keeps in check the deoxydating effect of vegetable matter in the soil, which in its absence tends to reduce the higher state of oxydation of the iron present in the soil into the lower state, when it does mischief by forming with acids in the soil soluble salts injurious to vegetation.

But the main purpose served by water during its percolation through the land is that of feeder of the plants. A fertile soil, cultivated so as to exhibit its fertility in the most profitable manner, has growing upon it crops whose habit and specific character are adapted to the climate in which they are placed, and to the character of the soil itself—it yields these crops in the order in which each succeeding to the cultivation of its predecessor shall find the soil, chemically as regards its contents, and mechanically as regards its texture, and practically as regards consequent cleanness of the land and the fitness of their respective times of cultivation to one another, in the best condition for the supply of the wants of the crop in question—it is annually manured and cultivated so as best to meet the current wants of the plants cultivated on it—but it is especially dependent for all its powers to bring these crops to a fruitful maturity upon the fact that there is during every shower and after every shower of rain a continual current of water and current of air throughout its substance, not too rapid lest its soluble parts should be washed to waste; indeed, it is hardly possible to be too slow; slow enough however, to dissolve from the soil whatever it contains of food for plants, and fast enough to be continually bringing fresh supplies by every mouth which the absorbing extremities of the roots of plants present.

All these purposes of *warming* the soil, of *introducing substances* within it which shall operate chemically upon the mineral and other matters within the soil, and of *converting the soil into an efficient vehicle* of the matters which it contains, are answered by the percolation of water through the soil. You must not think then of drainage as being a contrivance for getting rid of water as an enemy from the land; nor must you think of a wet and ill-drained field as being merely an illustration of the injury done by water *in excess*, as it is called. Water need hardly ever be an enemy, and need hardly ever be in excess. Drainage is a contrivance for making use of it as a friend, and an ill-drained field is an illustration of the mischief done by water, whether there be little of it or much, when not in motion.

It is well however to consider the *mischief* that may be done by the percolation of water. If, as it moves through the soil, it contains the food of vegetables in solution when it passes the mouth-piece of a plant, no doubt it also contains useful matters in solution when it passes into the drain which is to convey it altogether away, and the waste of food for plants by our drainage water is a matter of considerable importance. It has been most admirably investigated by Mr. Wray during the past year. His results are given in the following table:

Samples of drainage water from Mr. Paine's very highly manured field contained grains per gallon of		Samples of drainage water from Mr. Acland's poor clay contained grains per gallon of	
Ammonia.	Nitric acid.	Ammonia.	Nitric acid.
.018	7.17	.003	4.78
.018	14.74	trace.	2.99
.018	12.72	.012	.628
.012	1.95	.012	.12
.018	3.45	trace.	.485
.018	8.85		
.006	11.45		
.018	3.91		

He found that the drain of water from highly manured fields near Farnham contained 18-thousandths of a grain of ammonia in every gallon; but as much as 4 to 14 grains of nitric acid: while from ordinary poor arable soil in Devonshire the drain water contained from 3 to 12-thousandths of a grain of ammonia, and from one-tenth to as much as 4 grains of nitric acid in a gallon.

From this it appears that there is a very large waste indeed of nitrogen in the form of nitric acid in the drainage of very highly manured fields; comparatively little, however, in the case of fields of ordinary cultivation. Whatever it is, we must simply bear it as a tax upon the otherwise general advantage of the practice of land drainage. One very satisfactory thing observable in the results of these experiments is the comparatively small quantity of ammonia which the samples of rain water contain, even when compared with that present in the rain water which falls upon the land.—*Agricultural Gazette.*

Divine truth, in its integrity, has a vitality, an inherent principle of life, of which fruit unto life eternal is but the natural result.

The Southern Planter.

RICHMOND, VIRGINIA.

Tobacco.

As many of our subscribers intend to "go in" for a crop of Tobacco this year, for *the first time*, we think it best to give them a word of caution in advance of their efforts, hoping thereby to abridge, or at least to mitigate the trouble to which they are surely destined, after their crop is pitched. Premising that we have had but little experience in making this crop, except so far as the *trouble* is concerned, we give them a few items of the advantages and disadvantages of its cultivation which have appeared most prominent to us. We have commenced growing tobacco because—1st. We think it best to have as great a variety of crops on a farm as can be advantageously worked—so that if the season should prove unpropitious to one or more, it may not necessarily be so to others. 2d. It is said to stand drought better than almost any other staple, and it cannot be destroyed by chinch bugs—of which we stand in wholesome dread from the remembrance of their fearfully destructive ravages in some summers past to both wheat and corn. 3d. It is a great incentive to taking care of, and hauling out every spring, a supply of manure equal to the task of making rich an indefinite number of acres—indefinite, because the number must be adjusted in all cases to the amount of force employed in the culture. 4th. Because we believe wheat and clover both come better after it than they do after any other crop. 5th. It affords profitable employment to the laborers of the farm in weather unsuited for any other profitable occupation. Thus much *in favor* of cultivating the weed. Let us now say a word in relation to the *errors* in its cultivation, which are apt to be common to all beginners. 1st. Too much land is put in tobacco. The difficulty thus put in the way of the novice, is not apparent until about the time of harvest (the early cultivation very much resembling that of corn, in ploughing, siding, &c.) then, when worms are numerous, and the crop requires the most vigilant attention, the incapacity of hands who are not accustomed to the plant, becomes painfully manifest. Farm laborers who are experienced in tobacco culture, can do double the work in "worming" and "suckering," that the best manager can get out of "green hands," to say nothing of their greater dexterity and skill in handling, stripping, packing, &c., after the crop is made. We would therefore advise our friends who are about to begin growing tobacco, to undertake a small patch only, for the first year, in order that their employees may get somewhat accustomed to the work before them. We do this, because *we have paid for our experience*, "through the nose," and would like to guard them from a similar fate. We would rather have the tobacco from two acres, which had been entirely free from worms, and thoroughly "handled," than that from six acres if badly worm eaten, and unskilfully managed; and believe that the former would bring more money in market. For a beginner, we would advise *less than an acre* as the allotment to each unexperienced hand, in "pitching the crop." 2d. So much time and attention are necessary for the proper care of the crop, that little is left for fencing, and other improvements about the farm. It is useless for us to enlarge on the points, or to add any thing to the "trouble" side of the account, as a full discussion of all the "*pros* and *cons*" of the subject, is already begun in our columns, between two gentlemen of experience and ability. To their essays, we advise our readers to give a careful perusal. We will, however, copy from the *American Farmer*, the following sensible hints:

"SHALL WE GROW MORE TOBACCO?

"There is a great disposition at this time, we find, in sections where tobacco growing has been heretofore unknown, and among persons entirely unacquainted with its culture and management, to undertake the cultivation of the crop.

"Our advice has been sought, as to the policy of doing so, and a few words on the subject may not be useless to a number of our readers.

"In the first place, let us say, then, that the profits of tobacco culture have been very much exaggerated by the publication of prices obtained, within the two years past, for very extra small parcels. These reported prices are no indication at all of the general market. Nevertheless, it is true that the prices of 1857 were very remunerating, and the prices of the past year, though much smaller, were very fair. In consequence of these prices, the culture has already been very much increased, without a corresponding increase in consumption, and the stimulus given to the production of the crop all over the country, it is easy to foresee, will result, in a few years, in very low prices.

"It is very bad policy generally, an account of the failure for a year or two of any staple, or temporary depression of price, to change one's plans. The best rule is, to hold on steadily and diligently to whatever crops you have prudently determined upon, and wait patiently for a favorable change. It is no argument that the crop of wheat will fail next year, because it failed last year, and the very inclination so common now to abandon wheat or corn, in a measure, and adopt tobacco, is tending at once to raise the price of the former, and depress the latter. So that the new tobacco planter, by the time he gets his houses built, and himself and his farm hands sufficiently familiar with a crop which requires much experience to manage to advantage, may find the price again at a very low figure.

"Tobacco culture while it is not so directly exhausting to the land as is generally represented, so engrosses the labor of the farm as to interfere seriously with improvement. We recommend its culture, therefore, only to those, whose farms, fences, &c., may be in good condition, and who may have labor at command to which they cannot give otherwise profitable employment.

"In connection with our own remarks we give the following from an intelligent correspondent, in one of the Southern counties of Maryland:

"'I do not think it judicious to advise any one to enter into its cultivation, except in a small way, as from my present information, there are so many going at it another year, if there should be a large crop, the prices will be likely to decline to something like they were in '46 and '47, when I sold tobacco for $2.50 per hundred (*average.*) I do not consider it a paying crop at a less average than $6, and that has been about the average price obtained this year in our neighborhood. I think I shall continue to make small crops of it hereafter, but it is only because of the fear of failure in wheat, in which case tobacco may "help the *lame dog* over the stile." I started into an exclusive grain culture, 4 years ago, with the conviction that tobacco had well nigh ruined our section, and would ultimately do it, if persevered in. This conviction is still impressed upon me, if its cultivation is continued under the old *three* field system, where the same piece of land in its rotation is put into tobacco with all the manure that can be raked and scraped from all sources of the farm, without giving a particle to the poor corn knolls and barren flats.'"

We intended to make some remarks on the preparation of "Plant Beds," but we find in the columns of our worthy neighbour, the *Southern Farmer*, (published at Petersburg,) an excellent article on this branch of the subject. We refer our readers also to the article from our esteemed correspondent, published in our December number, under the head "Tobacco." From these two, can be derived all necessary instruction for the proper preparation of their plant beds.

We will only add that we prepared last season a large bed, by ploughing it thoroughly with a "jumping coalter," instead of the more usual way of chopping them with hoes. We had a plenty of plants on this bed, and found the "coalter" more expeditious, and less troublesome than the hoe.

Will some of our readers who have tried the plan of raising plants by using guano *without any previous burning of the beds*, give us their experience in time for our March number.

PREPARATION AND TREATMENT OF TOBACCO PLANT BEDS.

Messrs. Editors:—In the *Farmer* of November 20th, there is a communication on Tobacco Beds, by "B." of Amelia county—some of the positions of which I can by no means assent to—being directly opposite to my experience. His experience is, "that as a general thing it is not safe to top-dress with stable manure." My experience is that it is not only safe, but highly advantageous; and this opinion of mine is corroborated by the experience of some of the best tobacco makers around me—and hence I will state how and when I apply the stable manure.

Early in the winter I take out of my stable some manure that is free of trash, and put it on a plank floor where it can get *thoroughly dry*; when it gets so, it is then forced through a guano sieve, very little rubbing being necessary. I will here state that I never cover my beds with any kind of brush, but before the plants appear, I give the beds a good coating of this *dry, fine manure*; this operation is repeated in a few days after the plants make their appearance, and then once or twice afterwards; never passing over any spot, however bare of plants; as experience and observation have taught me that the coating of manure will, in most cases, cause the seed to germinate where they had not done so before. Where the manure is *dry and fine*, you may cover the plants up entirely, without the least risk of injury.

I find that *dry, fine stable manure* weighs eleven pounds per bushel; and I have, the last spring, applied as much as four bushels to one hundred square yards—which would be forty-four pounds to that space. One bushel (eleven pounds) at a time, gives a very good dressing; but I have applied at one operation as much as one bushel and three quarters; that would cover plants entirely up, if they were small.

If the fly attacks my plants, I apply a very thick coating of this *dry, fine stable manure*; for my opinion is, that if any thing will drive them away, this thick coating of manure will. Let the manure be *dry and fine*, and then watch the beds closely; a plant bed needs *nursing*; if the farmer does not do this himself, there must be a trusty person to do so in his stead. Do not give it up to Tom, Dick and Harry. I am not opposed to top-dressing with guano, but do so after the plants get to a tolerable size—for instance, in the last two or three weeks before planting.

As yet I have said nothing respecting my mode of preparing plant beds; and as it differs very widely from the plan in common use, I will here state what it is. If I take a piece of fresh ground, (I prefer standing beds,) I apply axes and grubbing hoes, until all roots are taken out. I then apply the new-ground coulter, working it as deep as I can; and after getting off what roots had been left, I cross-coulter; this time forcing it up to the beam. I then hoe it as fine as I can with grubbing hoes, and next with broad hoes until I get it to a fine tilth, after every operation, getting off as closely as possible all roots; then rake it over, getting it quite smooth.

The bed is now ready for the guano. I apply it at the rates of about four hundred pounds to the acre; hoe it in deep with broad hoes, and then rake over nicely. I next cut with the grubbing hoe small trenches, running across the bed, and some ten feet apart, and nearer than this if the ground is any way sobby; then sow the seed and pat the ground with the foot. No matter how many of these small trenches there are, no ground is lost; for they are made before the seed are sown, and of course the sides and bottom have as many seed sown over them as any other equal space of ground.

My preparation of standing beds is nearly the the same as above. I *coalter very deep*, and use grubbing hoes and broad hoes until a fine tilth is obtained; *deep and thorough working* is needed. About the first of August I cut off close every thing that is on the bed, and cover it over to the depth of five or six inches with leaves, which are removed a few days before burning. About three years ago there appeared in the *Farmer* a communication on plant beds, from which I drew some valuable lessons, worth far more to me than the subscription price of your paper during my life time; and hence I have thought that as I was geatly benefitted by a brother farmer, it was my duty to try to benefit some other one.

S.

Louisa Co., Va., Dec. 1st,, 1858.

Acknowledgments.

Mathematical Monthly.

We have received from J. W. Randolph, Esq., No. 121 Main Street, Richmond, the two first numbers of the above periodical, published at Cambridge, Massachusetts, by John Bartlett, and edited by J. D. Runkle. Price $3 per annum.

A paper specially devoted to the science of mathematics is a decided advance in the line of progress, and another evidence of high estimation of the power of the press. The object of this Journal is not simply "*the advancement of the science*"—which would circumscribe its interest, and limit its circulation to a few professed mathematicians and savans, but also "*the elevation of the standard of mathematical learning*" by a "sufficiently comprehensive and elastic scope, to embrace all grades of talent and attainment—including students in one extreme, professed mathematicians in the other, and necessarily embracing all intermediate grades of teachers and labourers in this vast field"—thus enlarging the sphere of its usefulness and commending it to a more general acceptation.

It will be readily perceived that a well-conducted journal occupying ground of such breadth and extent, cannot fail to advance the intelligence of the country, by enlarging the area of popular knowledge, as well as greatly aid the intuition of common sense by affording simple explanations of the general laws applicable to a thousand things, rendered familiar by their use in the every-day business of life, the principles of whose utility are, to an undesirable extent, unknown to popular intelligence.

Believing, with the Editor, "that a Journal of this character in which all interests shall blend and co-operate is needed 'that it will occupy ground unoccupied by other periodicals,' and will be of great importance in advancing the intellectual character of our country," we cannot but recommend it to the patronage of our readers.

We extract from the first number the following suggestive article:

"Note on Equation of Payments—by G. P. Bond.

"The time at which two or more accounts, bearing interest from different dates, may be settled by a single payment of a sum equal to the total amount of all the debts, is found, according to the rule commonly used, in the following way:

"*Multiply each debt by the time that must intervene before it becomes due, and divide the sum of the products by the sum of the debts. The quotient will be the interval of time required.*

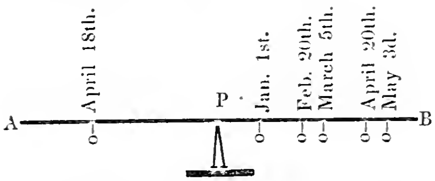
"If we wish to find the distance of the centre of gravity of a number of weights suspended on a straight rod, measured from a given point in the rod, we *multiply each weight by its distance from this point, and divide the sum of the products by the sum of the weights. The quotient will be the distance required.*

"The analogy between the two processes suggest an easy mechanical method of computing the equation of payments, which we will illustrate by an example.

"A merchant owes the following sums, and requires to know the time at which, by a single payment equal to the sum of the several debts, all the accounts will be settled with interest.

	Debts.	Bearing Interest from
	$500	Jan. 1.
	260	Feb. 20.
	110	March 5.
	50	April 20.
	5000	May 3.
Total,	5920	

"In the annexed figure, A B is a bar of wood or metal balanced at P, and graduated with equal divisions to the months and days of one or more years, on each side of P.



"At the graduation corresponding to Jan. 1st is hung a weight representing $500, at the date Feb. 20th another of $260, and so on, representing each sum by a proportional weight suspended from the bar at the proper dates. On the opposite side of P is hung a weight equal to the sum of all the other weights. The date (in this example, April 18th.) at which it must be placed in order to restore the balance of the bar, is the time when the payment of the total sum of $5920 will discharge all debts with interest.

"The chief difficulty with the apparatus is to apportion the weights, but no great nicety will be needed, especially as fractional parts of a day and the difference between discount and interest paid in advance, are commonly disregarded in such settlements.

THE VIRGINIA FARM JOURNAL.

M. S. Crockett, Editor. Published in this city weekly, at $2 per annum.

We have received the three first numbers of this well-conducted paper. We find our neighbour Crockett like his former namesake, the gallant Colonel, is one of the "go ahead" stamp, and that he will be an earnest, faithful, industrious workman in his new enterprise. We wish him the most abundant success.

As he says "there can be no jealousy between us," we expect to find in him a most efficient ally: a neighbour with whom we can march "shoulder to shoulder" in our efforts to speed the progress of the good cause which we have both espoused, and to which we would alike dedicate our best endeavours.

Every farmer in Virginia ought to take the Farm Journal, and the Southern Planter too. We cordially invite them to do so.

THE GARDNER'S MONTHLY AND HORTICULTURAL ADVERTISER.

We have received, and shall be happy to place on our exchange list, this instructing and handsome paper, "devoted to Horticulture, Arboriculture, Botany and Rural Affairs. Published at No. 23 Sixth street, Philadelphia. Thomas Meehan, Editor. Price $1 per annum. It is a paper which every gardner should have. We wish it success.

GENESEE FARMER.

The January number of this long established and valuable Journal comes to us replete with a rich variety of practical agricultural matter—adapted to the wants of its readers in all their diversified pursuits, as may be learned from the following list of Prize Essays which, besides other interesting matter and editorials, grace its pages:

"GENESEE FARMER PRIZE ESSAYS.

Farming as a Vocation.
Sociality among Farmers.
Plan of a side-hill Barn for Cattle, Horses, and Sheep.
Preserving Roots for winter use.
How should we improve our Highways?
Rail vs. Board Fences.
Construction of Stone Walls.
A portable Fence, not patented.
Fattening Sheep in winter.
Management of fine-wool Sheep.
Management of coarse-wool or motton Sheep.
Fine vs. coarse-wooled Sheep.
On the most economical way of Wintering Horses.
On the advantages and disadvantages of Grain Drills.
Advantages and disadvantages of Drilling wheat and other grains.
Wheat farms for Dairy purposes.
Cultivation of winter Barley.
Rye and its cultivation.
Is Corn a more profitable Crop than Barley in Western N. York?
Corn-stalks—cutting, curing and feeding.
Clover Seed.
Applying Manure to Corn and Potatoes.
On the use of burnt Clay as manure.
The value of Lime as manure.
The benefits and the best mode of applying shell and other Marls.
Improving permanent Grass lands.
Is Stock-growing to be recommended in place of raising Grain?
Raising Pumpkins.
Earliest and best mode of raising Tobacco Plants.
Climate, soil, &c., of Missouri.
Can Corn fed to Hogs be made to pay East of Ohio?
Management of Bees.
Farm Book.

Will it pay to keep Poultry in large numbers?
Should the Suckers be removed from Corn?
How can Hens best be kept so as to procure Eggs in winter?
Grafting old Apple Orchards.
Cultivation of Lima Beans.
Pruning the Vine—when and how.
Raising Melons with the use of Hot-beds.
On the advantage of Sewing Machines in Farmers' families.
On the Management of Canaries and other Birds in the house.
Cheese-making from a small Dairy.
Bread-making.
Butter-making.
Dressing Poultry for Market."

THE FAMILY JOURNAL.

A weekly paper, devoted to Literature, News, Romance, Science and Art. John B. Williams, Charles H. Moore, Editors and Proprietors.

Terms invariably in advance.

One copy one year,	. . .	$2
Four copies	" . . .	7
Ten "	" . . .	15

Address WILLIAMS & MOORE, *Baltimore, Md.*

It is tastily gotten up, conformable in its matter with the prescribed scope of its prospectus, and worthy of a place among the polite literature, which contributes so much to the enjoyment of the refined family circle.

THE HORTICULTURAL MONTHLY.

A Journal of Rural Affairs, published at Morrisania, N. Y., of 16 pages quarto, at 50 cents per annum. Edited by William H. Willcox.

It is embellished with handsome wood cuts illustrative of the picturesque in landscape gardening; of symmetry and beauty in rural architecture, &c., &c.

From the first able number now before us, we have the promise of interesting and profitable instruction from month to month through the pages of this paper, and at a price so low as to bring it within the reach of everybody who desires information on any of the departments of ornamental or kitchen gardening.

MICHIGAN FARMER. INDIANA FARMER.

We have received the first number of the weekly issues of the above papers. We are happy to see such evidence of progress in the North-west, as is indicated by a demand for agricultural weeklies, in addition to the existing monthlies. The Editors respectively have our best wishes for the complete success of their enterprizes.

THE WEEKLY SOUTHERN GUARDIAN,

As its name imports, is devoted to the interests of the South. It is published at Columbia, S. C., at two dollars per annum; and, as a fair proportion of its space is appropriated to the subject of Agriculture, it strengthens thereby its claims as a newspaper upon the patronage of the Farmer.

THE SOUTHERN CULTIVATOR,

Is among the most able and efficient Agricultural papers of this country. It is published at Augusta, Ga., for one dollar per annum, and edited by Dr. Lee and D. Redmond.

THE WISCONSIN FARMER for December and January has not come to hand. We had promised ourselves much pleasure in their perusal, and should hail their advent *as a visit from a friend.* We hope friend Hoyt has not forgotten us.

DEBOW'S REVIEW.

We have not been favoured with the receipt of a number of this valuable paper since September. We cannot at all afford to do without it.

THE SOUTH COUNTRYMAN.

We have before us the first number of a new paper, under the above title,—a monthly Agricultural, Industrial, and Educational Magazine. Edited by C. W. Howard, and published by W. H. Hunt, Marietta, Ga., 32 pages large octavo, at $1 per annum.

It is ornamented with a bust of General Oglethorpe, the founder of Georgia, and is neatly printed and well edited. We heartily wish it abundant success.

THE DEMOCRATIC AGE.

A monthly, devoted to Statesmanship, Science, Art, Literature, and Progress. Price two dollars and fifty cents a year in advance. C. Edwards Lester, Editor. New York: Edwards & Co. Printers. We welcome it to a place on our exchange list.

We have received J. M. Thorburn & Co.'s Descriptive Catalogue of Vegetable and Agricultural Seeds, &c.—Garden, Field, Fruit, &c., Seeds. Embracing every standard and improved variety. Also Tested Novelties, both of Domestic and some of European origin, suited to the climate of the United States. 1859. No. 15 John St., New York.

We are indebted to Messrs. Bridgeman for their Descriptive Catalogue of Fruit and Ornamental Trees, Shrubs, Vines, &c., cultivated at their Nursery and Greenhouses, Astoria, and sold at Bridgeman's Horticultural Establishment, Nos. 876 and 878 Broadway, N. Y.

Our Agents.

The following gentlemen have kindly consented to act as our agents, and are authorized to give receipts in our names for payments due the "SOUTHERN PLANTER," by either old or new subscribers:

JNO. W. BURKE, Alexandria, Va.
MAJOR P. WILLIAMS, Washington City, D. C.
WM. F. CATLETT, Guiney's Depot, Va.
TURNER & ACREE, Walkerton, K. & Q., Va.
JOHN T. CHILDREY, Henrico.
JAMES N. GOLDSBOROUGH, Easton, Md.
GEO. C. REID, Norfolk.
BENJ. F. GRESHAM, Newtown, K. & Q., Va.
F. N. WATKINS, (at the Farmers' Bank,) Farmville, Va.

Marl.

We received a letter from a gentlemen in North Carolina, (which we unfortunately mislaid,) making inquiries on the subject of marling, and expressing great pleasure in the perusal of the articles of Wm. D. Gresham, Esq., and "Tide-Water Farmer," lately published in the "PLANTER." Our correspondent will find the information he wishes in the essay on "Calcareous Manures," by Mr. Edmund Ruffin, which can be procured at the Book Stores.

We have received from "Nicot" a communication on Tobacco, which we regret was not received earlier. It will appear in our March number, that for February being full. We return our thanks for it, while we rejoice that the subject is calling forth a full discussion.

For *ourselves*, we are going to try a crop every year, for years to come, if we live, and at all events hope by this course to *get back* our outlay for houses, &c., and to have some pretty clover lots, on the sites selected for the weed first to grow.

We shall be much interested in the discussion, and will lend a ready ear to both sides.

Fine Hogs.

We call attention to the advertisement of our friend, Mr. F. G. Ruffin, of his Improved Breed of Swine, which may be found in our advertising sheet.

We have frequently visited his farm, and seen his "Stock" of every kind. Of swine, he has some six or eight fine breeding sows of his own raising, white in color, and characterized by length of body, early maturity, good size, and a disposition to fatten readily. Also, some Essex and Berkshire Hogs.

The "Berkshire" Boar, we speak for, whenever his time may come to be "rotated out," to make room for his successor.

"Napier."

We regret to hear of the death of this distinguished Cleveland Bay Stallion, the property of our public-spirited friend, Dr. John R. Woods of Albemarle county, Va.

Napier was the winner of a good many prizes in England, as the best of his class, and was purchased by Dr. Woods at a high price, for importation to this country. He died a few days after being shipped.

The Dr. has "Havelock," an imported Cleveland Bay, at his farm near Ivy Depot, but we regard the death of Napier as not only a loss to him, but to all the lovers of fine stock.

Fine Arts.

MR. E. TROYE, ARTIST.—This gentleman has recently been in our vicinity, and we are happy to add, has left some most beautiful specimens of his skill as an artist, in our city. He has painted the portrait of the Messrs. Doswell's fine horses, "Planet," "Fanny Washington," "Nina," &c. Also H. J. Smith's "Kossuth," and Colonel Cocke's "Cleveland."

The pictures are true to life, and we would advise our friends who have not already enjoyed the pleasure of seeing them, to get a look at them. They may be found at the store of Geo. M. West, No. 145 Main street, or at the Agricultural Office.

Rhodes' Super-Phosphate.

The Charleston (S. C.) *Evening News* publishes the following extract from the report to the So. Carolina Agricultural Society, from the committee appointed on chemicals, minerals, &c., for the information of those who may feel an interest in the subject:

Extract from the Report of Exhibition of the South Carolina Agricultural Society, held at Columbia 9th, 10th, 11th and 12th November, 1858.

The Committee on Chemicals, Minerals, &c., beg leave to make the following report:

The Committee would call the attention of the Society to Rhodes' Super-Phosphate of Lime.—Experience has proven it to be a valuable fertilizer—said to be superior to Guano.

For the Southern Planter.

Preservation of Sweet Potatoes.

Mr. Editor—Your readers, who, like myself, are sweet potato growers, are indebted to Mr. J. Lucius Davis for his article published in your December number. Mr. D. has certainly given us a sure mode of preservation of that valuable esculent. Our regret is that it is not adapted to crops of 500 or 1000 bushels without considerable cost in the construction of cellars and shelves. With due deference to the opinion of Mr. D., our experience would lead to the belief that pressure is not the cause of the rotting of the potato in bulk—but too high a heat generated in the *sweating process* as we call it. The fact that in a bulk of potatoes the bottom is always in a better state of preservation than the top (as our growers assert) would go to prove that pressure is not the cause of the destruction, Mr. D.'s mode prevents the generation of much heat, and is truly a perfect way of preservation adapted to quantities not very large. We fear an economical plan of storing a large quantity of the sweet potato with certainty of preservation from both warm and cold weather is yet a desideratum. A premium on this head from our Agricultural Society might encourage experiment which perhaps would throw light on this important subject.

There is a point connected with the growing the sweet potato as a crop, which is a mystery to us, the uninitiated in vegetable chemistry. It is well known to our growers that a succession of four or five crops (even if the land is yearly supplied with a liberal quantity of the usual manure) reduces the soil to a condition unfit for the growth of the vine or the formation of tubers. The soil is yet in a state of fertility capable of producing a fair crop of corn, oats, &c. It would appear then that the cultivation successively of the potato has removed from the soil some element necessary for its growth and formation.

You will confer a lasting benefit, if by reference to your agricultural science you can tell us what manure or what rotation of crops we must resort to, to bring these lands to the potato bearing state again. G. G. M.

New Kent, Dec. 21, 1858.

Will some of our subscribers furnish us with an analysis of the sweet potato, if they can.

We have not been able to find such a thing. A gentleman of this county informs us that he has seen sweet potatoes raised on the same piece of ground, year after year, by manuring highly, and has promised to write an article for the "Planter," giving his views and plan of cultivation. We shall be glad to hear from our Nansemond friends also on this subject.

For the Southern Planter.

Information Wanted.

Danville, Va., Nov. 21, 1858.

Mr. Editor—Will you or some of your correspondents who have had experience, inform me how to apply spoilt herrings as a manure to corn or tobacco. We have a lot of them we want to use on our crop next year, and as we have had no experience in their use, any information upon the subject will be thankfully received by a subscriber. Very respectfully,

WM. P. GRAVES.

Will some of our subscribers who have tried fish as an article of manure reply to the above request, and thereby oblige not only Mr. Graves, but ourselves.

In the *Southern Planter* for October, will be found on page 622, an analysis of fish and some other refuse articles used as manure, copied from the "Transactions of the Highland Society."

Virginia State Agricultural Society.

BRANCH II.

In our December number, our readers were informed of the reason why no report accompanied the other reports of Premiums then published, on the subject of Essays. That report has since been furnished, and is as follows:

Premiums on Written Communications.

The committee on Branch II, not having had opportunity to examine the various communications submitted to them, in time to justify a report upon them, at the last fair of the Virginia State Agricultural Society, determined to defer doing so until they could, by careful consideration and comparison, do justice to their merits in rendering their awards. They now respectfully report, that they have awarded the following premiums:

To Professor William Gilliam for his Communication "on the Occurrence of the Phosphates in some of the Tertiary Deposits of Virginia." $50 00

To William M. Tate, Esq., of Augusta, for his Essay "on the Cultivation of Indian Corn, on the Clay Soils in the Valley of Virginia." 20 00

To Willoughby Newton, Esq., of Westmoreland, for his communication "on the Use of Compost Manures, in Seeding Wheat with the Drill; and on Draining Basins on Table Lands, by Boring with the Post-hole Auger." 20 00

J. Ravenscroft Jones,
Richard Irby,
Wm. B. Price. } *Committee.*

Jan. 8, 1859.

From the British Farmers' Magazine.

Stock-Feeding.

NO. I.

In entering upon this subject, which extends into various sections of practical science, it may be well to take each division in turn, and afterwards sum up the evidence.

There are, in the first place, evidently two grand divisions of the subject; viz: the animals of which it is proposed to increase the flesh; and the vegetable food, which it is the object of the stock-feeder to transmute into flesh, by introducing it into the stomachs of the animals.

As the feeding of stock, and not the breeding, or pointing out their various qualities, is the subject of these articles, particular allusion to the cattle will be unnecessary, as the treatment which will produce any desired effect upon one animal will have, generally at least, a like tendency with another—that is, the best means for fattening one will be the best for fattening another, and the best thing for increasing the yield of milk from one will also be the best for producing a similar result with another, under similar circumstances. Not that it is reasonable to expect that any one kind of food or treatment will produce indiscriminately various or opposite results, and *in this article the present mode of fattening only will be considered.*

The inquiry will, therefore, be commenced with the food itself, showing of what it really consists, and what becomes of it when consumed by the animals.

Vegetables will increase in weight many fold when growing, without abstracting much weight from the soil, as they derive almost their entire bulk, directly or indirectly, from the atmosphere; which is in some degree owing to their containing in their substance, and absorbing from the soil, very small quantities of salts, &c., which, having an affinity for the gases, fix or consolidate them.

It may be needful to premise, that the elementary bodies, as oxygen, carbon, hydrogen, nitrogen, &c., (of which, except a few salts, of very small amount, all vegetable food is entirely composed,) are substances which have never been decomposed, and are presumed to be utterly incapable of being so; for though they may be changed from solid to liquid or even to vapour, they are still identical; thus sulphur may be solid, liquid, vapour, or combine to form acid, and the acid again—with, for instance, lime—form gypsum. But still it exists as sulphur, and may be again recovered, as under no circumstances can either it or any other substance be annihilated.

Yet, one of the earliest impressions in connexion with stock feeding, which strikes the mind of any one who really thinks for himself, is the very small increase of an animal, compared with the large quantity of food taken into its system, and that the balance or loss is not represented by the weight of manure. If we take the following table by Dr. Playfair, given in the 6th vol. of the *Royal Agricultural Society's Journal,* as being the amount of various foods necessary for producing one pound of flesh; viz:

100 lbs. turnips,	9 lbs. oatmeal,
50 " potatoes,	7.1 " barleymeal,
50 " carrots,	7.4 " bread,

4 lbs. lean meat,
3½ " peas,
3.3 " beans.

Where does the balance go? Even the flesh, which is almost identical with the product required, is shown to be reduced to one-fourth. Although there is a large quantity of water in the roots, and some also in the meals, it must be remembered that the "pound of flesh" produced, too, is in a moist state.

By drying some of the usual food until every particle of water is evaporated, and noting the proportion of loss in weight, from this may be calculated what would be the weight, when dry, of any quantity of the same kind of food; and experiment will prove that the total weight of flesh added and manure made (both also dry) will not nearly amount to the weight, when dry, of the food given to the cattle.

Though it is quite certain that elements cannot be annihilated, it is equally clear that they have here been lost to the feeder. There are in vegetables the necessary elements of which, when mixed with the air by respiration, to make flesh; and it is only ordinary prudence to prevent, as far as possible, their loss or escape during the process; yet out of say 100 lbs. of vegetable carbon, only a small proportion is usually transmuted into animal carbon. But if one portion of the 100 lbs. will undergo this change, why should not another portion, or, in short, every other portion, of the whole 100 lbs.? There is only one kind of carbon; it is not capable of being annihilated—it is merely required to change its combinations; and certainly there ought not to be so great a loss in merely, as it were, pouring it from one vessel into another.

The proportions of food wasted and assimilated are purposely left somewhat indefinite; for if the fact of their being a great and unnecessary waste is made evident, the object of the present article is attained, as it is more desirable to point out precisely the source of the loss, and that it may be prevented, than to be critically exact about the amount. In fact, none of the elaborate statements in reference to nutritive properties of various foods, even though made by Sir This, or Professor That, as being the actual result of most careful, and perhaps curious experiments, published by societies or associations rejoicing in the most dignified titles, are any better, for practical purposes, than the observations of sensible persons of less pretension. In practice the results vary: the roots or grain may or may not be in equally dry condition, and different animals have different qualities for "putting up flesh," or the same animal may vary at different times, &c.; consequently, any statement which descended to the utmost nicety would be less useful than another, which although not so correct in detail, examined the subject on broad principles. And as it is now purposed to show how a very large amount of the really available dry elements of food is totally lost, fine calculations are perfectly unnecessary.

Vegetables consist of water, a quantity of matter called gum, sugar, starch, lignine, albumen, and gluten, according as it assumes various appearances, and also of a small quantity of salts, &c., the latter not amounting to more than about 1-500th part of the whole, and of these salts, &c., no notice will be taken at present, nor *until it has been first demonstrated that to the small constituent portions of food are we chiefly indebted for the continuance of life itself.*

The following table will show the proportions of water and soluble solid matter in a few articles as examples, and also of starch, sugar, gluten, &c., in 1,000 parts of the soluble solid matter:

Article.	Water.	Soluble solid Matter.	Mucilage or Starch.	Sugar.	Gluten or Albumen.
Barley	80	920	790	70	60
Oats	257	743	641	15	87
Potatoes	770	230	180	15	35
Carrots	902	98	3	95	0
Turnips	936	64	9	51	2
Clover	968	32	29	1	2

The most obvious difference is in the proportion of water; but neither that nor the varying amounts of starch, sugar, gluten, &c., account for the well known different values for feeding purposes, but which these articles will gradually trace to their true cause.

As for the starch, sugar, gum, &c., the subjoined table will show that they are all nearly alike, or only vary slightly in their composition, and therefore the proportions of these substances contained in any kind of food are not so important as frequently has been represented:

	Carbon	Oxygen	Hydrogen	Nitrogen
Gum	42.23	50.84	6.93	0
Sugar	42.27	50.63	6.90	0
Starch	43.55	49.68	6.77	0
Lignine	52.0	41.25	5.75	0
Albumen	52.8	23.8	7.5	15.7
Gluten	55.7	22.0	7.8	14.5

Before proceeding, it may be necessary to explain that water exists in two states in food as used, viz: One in which it may be driven off by submitting the food for a sufficient length of time to a temperature equal to boiling water until it has evaporated. The other, in its elementary state as oxygen and hydrogen, as shewn in the table; but whether they are in combination or not is not very clear, nor does it particularly signify, as they occupy about the same compass, and are not in the expanded gaseous form.

By deducting from the figures in the above table the exact amounts of hydrogen necessary to combine with *all* the oxygen to represent the proportions existing in water, there is found a slight excess of hydrogen in each instance. In the cases of the albumen and gluten, there must also be deducted the hydrogen and nitrogen in the proportion to form ammonia; and here again there is still a small excess of hydrogen. *But of this small excess hereafter.*

1. The object is now to show the weighty loss of carbon. With the exception of carbon, all the rest of the food has been shown to consist entirely of water and its elements, and the elements of ammonia, with a slight excess of hydrogen, and a few salts, &c., of no great bulk. Therefore *carbon is the only available bulky matter* contained in the solid part of vegetables, be it termed gum, sugar, starch, lignine, albumen, or gluten; for, in the animal, the oxygen and hydrogen pass off as water. And having now traced

out only the bulky disposable element, it will be shown what becomes of it.

Carbon and oxygen have a great affinity for each other, and combine in certain proportions to form carbonic-acid gas, which is elastic, and like all other gases, is volatile, unless there be present something for which it has an affinity, and with which it will combine, and become what is termed fixed.

After its introduction into the stomach of the animal, to use the language of Professor Liebig, "it signifies nothing what intermediate forms food may assume, or what changes it may undergo in the body: the last change is, uniformly, the conversion of its carbon into carbonic acid." The carbon contained in the food is introduced through the gullet into the stomach, and the oxygen contained in the air by respiration through tho wind-pipe into the lungs; and eventually they come in contact, form into carbonic acid, and are both removed from the system at every respiration and by every pore. The oxygen is, as a thief, allowed to come in and steal the carbon which the stock-feeder has expended large sums of money to obtain. But if a hare, or other similar depredator, had come into his fields, to rob him of the carbon contained in his crops, he would, probably, have made food of it, and been richer, for having both saved his carbon, and detaining the thief which came to steal it. *So it should be with detaining the oxygen; but of this hereafter.* As the combination of carbon and oxygen takes place in regular and definite proportions, and as the lungs of an animal, under similar circumstances as to exercise, &c., inhale a regular quantity of oxygen, it is also evident that to just saturate or satisfy this oxygen, a certain regular quantity of carbon is required; and it is exactly this amount, which is contained in the food, that is found to keep an animal in a stand-still condition, neither adding to its flesh, nor losing it; *and no carbon can be deposited* (leaving out the action of the small quantity of salts, &c., in the food) *unless a larger quantity is put into the system than there is oxygen taken in to combine with it,* or, in other words, more than the thief can carry away.

It is freely admitted that animals will, and do actually improve in condition, and increase in bulk, by having plenty of good food given to them. So a person may fill a tub with water, though it may leak on every side, if he puts the water into it faster than it runs out of it; but he would do so much sooner, and with less waste of water, by adopting some plan for preventing the leakage. At present our stock feeders might be represented as the Daniades, who were doomed to collect water in buckets full of holes.

The real question is this: Do animals retain all the nutriment contained in a certain amount of food, which it is possible they ean be enabled to retain? or is it not true, that out of a certain quantity of food given, a large portion neither shows itself as flesh nor manure, but is lost as gas? This matter has never been properly attended to, and the "agricultural mind" has been so busy with improving the breeds of cattle, that it has not had time to see after the best mode of feeding them.

No doubt there are now greatly improved specimens of stock, which will feed in shorter time and with less expense than could formerly be done; but this is, after all, comparatively a small improvement, for they still absolutely waste and dissipate a large proportion of the dry weight of all their food; and the chief variation from ordinary stock will probably be found to consist in those which are the most rapid feeders, having proportionally the smallest lungs, consequently inhaling a smaller quantity of oxygen, to rob them of the carbon they have eaten. They are, practically, owing to the small size of their lungs, even without restraining their exercise, (in which they would not be disposed to exceed,) placed about on a par with the larger-lunged cattle when "tied up" and restrained from taking exercise, or, to speak more to the point, when prevented from inhaling so much oxygen as they otherwise would.

Such cattle are, however, in a low state of vitality, and very subject to disease, and even sudden death; for, not having in their composition that which would retain, by affinity, a good, firm hold on the mass of carbonaceous matter which they have accumulated, merely because of the smallness of their lungs, and their substance being as it were *deposited,* or, at most, held together by *very slight affinity,* they are liable to sudden decompositions, which totally disorganize their whole animal economy.

To sum up this portion of the subject; it is found that vegetation, which in some form is the food of cattle, has grown to the state in which it is generally used, by fixing gases from the air, and by absorbing water, (for the present omitting the salts, &c.) It is, therefore, composed of water, and *gases which have been, and may again become volatile.* When vegetables are taken into the animal system, they are decomposed; the water runs off; and *unless there be something present in the body, to absorb and fix the gases, they are volatilized*, and fly away, leaving no increase. It has been stated that the dry weight of food given is not equalled by the dry weight of flesh gained and manure made, and it is thus proved that *a large portion does fly away.*

Yet no pains are usually taken to absorb and fix this gas, which is naturally only fixed in a small degree; because it is the custom for persons to think they do well if they do as well as others, and the feeders of stock are not exempt from this feeling; they do not like to "force" animals, because it is "against nature," &c., when the truth is, that, *to produce further development, it must be produced on exactly the same plan that nature does*—consequently be more in accordance with the laws of nature than the wasteful method now in use. In short, it is helping nature.

Where is science? Where are the chemists? The latter pronounce carbon to be the great constituent both of vegetation and of fat, yet stand aloof whilst pounds of the former are used to produce ounces of the latter. What would be said, and done too, if the coinage was conducted on similar principles, and that a pound of gold only produced an ounce of gold coin? Is it not probable there would be some investigation of the fumes which ascended the chimney of the furnace, and, if it proved that the precious metal was thus carried off, that some endeavour would be made to condense those fumes and recover the gold?

In a future article the means of preventing this extravagant waste will be pointed out; but as it is most desirable to make good the ground already gone over, a week or two will be allowed to elapse, that any objections which may be offered or errors pointed out *in the principles, so far as at present stated,* may be considered, and either refuted or amended.

GEORGE H. BOLTON,
Agricultural Chemist.

Warrington.

From the British Farmers Magazine.

Stock-Feeding.

NO. II.

Having in the last article proved that a large amount of the carbon of food escapes during respiration, it will now be shewn how this carbon can be retained, and in a future article it will be shewn how this, as well as any other portion of the carbon of food, can be converted into flesh.

It may be allowable before proceeding, to advert to a few of the causes which have supported error, and obstructed investigation, of which the following are, perhaps, the chief:

That persons who have been schooled in, and taught to believe, particular doctrines, without even being allowed to investigate them; who have had degrees and honors conferred upon them, and who have long publicly espoused the doctrines thus "crammed" into them, are not, and cannot be expected to be sufficiently free to examine the basis of the theory upon which they have built their reputations, as by so doing they would undermine their own position.

One fallacy thus perpetuated is that of apportioning specific and separate duties to "starch," "sugar amylon," &c., &c., when they are only variations of each other, and are readily convertible from one to another; as for instance, starch becomes sugar during malting, and when food is digested the supposed differences cease to exist. The chief available substance in all cases, as before shewn, is carbon, differing in solubility in proportion to the oxygen with which it is associated—thus sugar is more soluble than starch; starch than lignine, &c.

Another obstacle is the practice of referring to the beautiful ordination by which the balance of nature is restored, by vegetables absorbing carbonic acid gas, and giving out oxygen; and animals absorbing oxygen, and giving out carbonic acid gas. This is generally held forth as a final answer, and intended to arrest all further inquiry. It is, however, worse than foolish to suppose nature's laws can be disturbed, as it pre-supposes a weakness in the Maker of those laws, and leads to the ridiculous idea of an Almighty weakness! showing the absurdity of allowing such doctrines to interfere with legitimate practical inquiry.

It is needful now to refer to the extensively-propagated, and generally-accepted, view of the purpose of respiration, which is evidently erroneous, viz:

1. That by the combination of carbon in the blood with the oxygen of respiration, animal heat is supported.

2. That the removal of the excess of carbon from the blood is essential to render it fit for circulation.

Now, the union of carbon and oxygen takes place with only a trifling change of volume, and therefore cannot be productive of much heat, heat being only disengaged where combination is attended with a considerable diminution of volume. Animal heat is chiefly supplied by the union of the *hydrogen* of food with the oxygen of respiration, which during combination condenses and forms water.

Then, if the blood does contain an excess of carbon, it is only an *excess in relation to something else.* If it were too large a quantity *per se,* why not abstain from adding more by the food, which consists principally of carbon? It would, however, be more correct to say that there is a *deficiency of some other element or elements in relation to the quantity of carbon,* which is the actual case.

In order to make this more evident, suppose, as it occasionally happens, that a most unusual abundance of fish were caught, where there was not at hand a sufficiency of salt to cure them; would not any sensible person, instead of saying there were too many fish, at once say there was a deficiency of salt? This is exactly the case with the carbon of the blood; but *all salt is not muriate of soda.*

All parts of the animal system are supplied and renewed with substances derived from the blood during its circulation through them—carbon is the main element in the composition of animal substances—consequently it is extremely absurd to suppose there is any advantage attending the abstraction from the blood of the chief element of the flesh.

Food, as generally used, always contains a larger portion of carbon than of salts capable of retaining it when in the body of an animal; and this is the reason of, and is demonstrated by, the *relative excess* combining with oxygen, and escaping as carbonic acid gas.

The obvious remedy is to supply the deficiency of salts having an affinity for this carbonic acid gas, and we have, by the natural conformation of animals, every facility for making such application effectual.

The carbon contained in the blood circulates with it through the lungs, and there, coming in contact with oxygen, is transformed into carbonic acid gas: and it must be evident that if we introduce, through the medium of the food, into the blood, soluble substances having an affinity for carbonic acid gas, and this gas, and consequently the CARBON (which is one of its constituents) WILL BE ABSORBED OR FIXED, AND THUS PREVENTED ESCAPING.

It is admitted that *free* carbonic acid gas is injurious to animals, and must be expelled from the system; but when this gas is *fixed,* it may, on the contrary, be rendered highly beneficial, and the carbon it contains as conducive to the formation of flesh, as any other portion of the carbon of food. It is obvious that before any further process can be commenced with reference to the carbon becoming useful for flesh-making, it must be prevented flying off; on the same principle that Mrs. Glass says, "first catch your hare," before detailing the process of cookery.

The fixation of carbonic acid gas has been attempted by various means, but being deficient in chemical knowledge the parties making the experiments have never yet produced any decidedly beneficial results; for instance, charcoal, ashes, &c., have been used.

Charcoal when fresh will undoubtedly absorb a large quantity of carbonic acid gas; but charcoal itself being carbon, is afterwards converted into carbonic acid gas, and both it and the gas it has previously absorbed escape.

Ashes, when fresh and well burned, contain caustic alkalies which have an affinity for carbonic acid gas; but before they reach the lungs they are liable to corrode parts with which they come in contact; and not only so, but meeting with fat already formed in the animal, they unite with and form it into soap, and thus being rendered soluble it is evacuated and lost. If the ashes, on the contrary, have been long made and exposed to the air, they will have already become saturated with carbonic acid gas, and consequently cannot absorb or fix any more, and are therefore inert, if not injurious.

There are, however, two plans by which the fixation of carbonic acid gas can be certainly and beneficially accomplished.

1. By introducing into the system, along with the ordinary food, a soluble neutral salt, having so feeble an affinity existing between

the acid and the base, that when in contact with carbonic acid gas the base will leave the acid, with which it was at first combined, to unite with the carbonic acid gas. Hence it follows that when such a salt is absorbed during digestion, and conveyed by the blood to the lungs, it will seize the carbonic acid gas there generated. It is, however, imperative that the acid with which the base was at first combined be of a perfectly harmless character, or one that wil decompose and resolve itself into its orginal elements (oxygen, hydrogen, and carbon,) which is the case with vegetable acids. This arrangement causes the compound to remain perfectly inert until it comes in contact with the very object we wish to seize, and the presence of that object at once fits it for entering into combination with it.

2. This depends upon similar principles, and is in fact only a slight variation, viz., that in this case the acid must have a greater affinity for elements it will meet with in the lungs than for the base with which it was at first combined; consequently in the lungs it will separate from the alkali, which will then seize the carbonic acid gas. Of course it is here also requisite that all the compounds formed must be harmless, and this can not only be accomplished, but they shall be highly conducive to the health and vigour of the animal.

These are not "theories," for there is large and accumulating evidence of the results obtained by their application. Orthodox professors, having contradicted each other until it has become a proverb that "doctors disagree," may attempt, when the evidence becomes irresistible, to show that they have been for years advocating the principles now being brought forward; but to which, as far as regards cattle-feeding, I lay absolute claim as the sole advocate.

G. H. Bolton,
Warrington. Agricultural Chemist.

Sing at Your Work.

Then, what an antidote it is to misfortune and sorrow. Think of Milton in the blindness, obloquy, poverty, and solitude of his old age. He had nourished, in his youth and early manhood, the power to appreciate what is perfect and excellent. So when his natural vision became darkened, and one by one, the lights of life went out, he had but to summon around him the beautiful and sublime things he had stored away in his chambers of imagery. Imagination, the mighty magician, selected, combined, and glorified all, forming them into a new world, a world infinitely nobler than the one from which he was excluded. There he reigned supreme and happy, though shut out from the light of day, and scorned by men.—Think of Milton's work and song.

To Measure the Contents of a Cistern.

A subscriber asks for some rule for measuring the contents of a cistern which he is building.

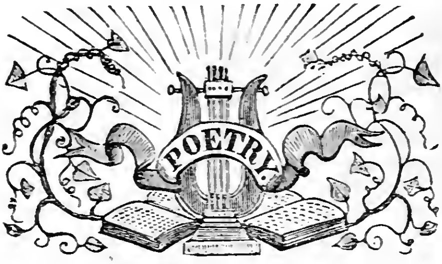
Supposing the part of the cistern which contains the water, to be of a circular form, the following rules may be adopted for ascertaining how many wine gallons it will hold.

1. Multiply half the diameter by half the circumference, this will give you the area of the bottom.
2. Multiply this by the height of the cistern in feet. This will give you the solid contents or cubic feet of the cistern.
3. Multiply this by 1728 and you will get the contents in cubic inches.
4. Divide this by 231, the number of inches in a wine gallon, and you get the contents in gallons.

Blasting Stumps.

The *Ohio Cultivator* relates the experience of W. A. Gill, of Columbus, Ohio, in clearing a field of stumps by gunpowder, which really appears to be a most powerful "stump extractor." He cleared a stumpy field of twenty acres cheaply and expeditiously, the following plan being pursued for each stump:

"Select a solid place in a large root, near the ground, and with an inch and a quarter auger, bore in, slanting downward, to as near the heart of the base of the tap-root as you can judge; then put in a charge of one or two ounces of powder, with a safety fuse, and tamp in dry clay or ordinary tamping material, to fill the hole, some six inches above the charge; then touch fire to the fuse, and get out of the way. The blast will usually split the stump into three pieces, and make it hop right out of the ground. If the charge is put in too high up, the blast will only split the top of the stump, without lifting it."



Visions of Childhood.

—At Pentecost, which brings
The spring, clothed like a bride,
When nestling buds unfold their wings,
And bishop's-caps have golden rings,
Musing upon many things,
I sought the woodlands wild.

The green trees whispered low and mild;
It was a sound of joy!
They were my playmates when a child,
And rocked me in their arms so wild!
Still they looked on me and smiled
As if I were a boy:

And ever whispered, mild and low,
"Come, be a child once more!"
And waved their long arms to and fro,
And beckoned solemnly and slow;
O, I could not choose but go
Into the woodlands hoar;

Into the blithe and breathing air,
Into the solemn wood,
Solemn and silent every where!
Nature with folded hands seemed there
Kneeling at her evening prayer!
Like one in prayer I stood.

Before me rose an avenue
Of tall and sombrous pines;
Abroad their fan-like branches grew,
And, where the sunshine darted through,
Spread a vapour soft and blue,
In long and sloping lines.

And, falling on my weary brain,
Like a fast-falling shower,
The dreams of youth come back again;
Low lispings of the summer rain
Dropping on the ripened grain
As once upon the flower.

Visions of childhood stay! O stay!
Ye were so sweet and wild!
And distant voices seemed to say,
"It cannot be! They pass away!
Other themes demand thy lay;
Thou art no more a child!

"The land of song within thee lies,
Watered by living springs;
The lids of Fancy's sleepless eyes
Are gates unto that Paradise.
Holy thoughts, like stars, arise,
Its clouds are angels' wings.

* * * *

"Look, then, into thine heart, and write!
Yes into Life's deep stream!
All forms of sorrow and delight,
All solemn voices of the Night,
That can soothe thee, or affright,
Be these henceforth thy theme."

LONGFELLOW.

"My Father's at the Helm."

The curling waves, with awful roar,
A little boat assailed,
While pallid fear's distracting power
O'er all on board prevailed;

Save one, the captain's darling child,
Who steadfast viewed the storm:
And cheerful, with composure smiled,
At danger's threatening form.

"Sportest thou thus," the seamen cried,
"While terrors overwhelm?"
"Why should I fear," the boy replied,
"*My father's at the Helm.*"

So when our worldly all is reft,
Each earthly helper gone,
We still have one true anchor left—
God helps, and He alone.

He to our prayers will lend an ear,
He gives our pains relief:
He turns to smiles each trembling tear,
To joy each torturing grief.

Then turn to Him, 'mid sorrows wild,
When wants and woes o'erwhelm:
Remembering, like the fearless child,
"Our FATHER's at the helm."

Labor.

Toil swings the axe, and forests bow;
The seeds break out in radiant bloom:
Rich harvests smile behind the plow,
And cities cluster round the loom;—
Where tottering domes and tapering spires,
Adorn the vale and crown the hill,
Stout Labor lights its beacon fires,
And plumes with smoke the forge and mill.

The monarch oak, the woodland's pride,
Whose trunk is seamed with lightning scars,
Toil launches on the restless tide,
And there unrolls the flag of stars:
The engine with its lungs of flame,
And ribs of brass and joints of steel,
From Labor's plastic fingers came,
With sobbing valve and whirling wheel.

'Tis labor works the magic press,
And turns the crank in hives of toil,
And beckons angels down to bless
Industrious hands on sea and soil.
Here sunbrowned Toil with shining spade,
Links lake to lake with silver ties,
Strung thick with palaces of trade,
And temples towering to the skies.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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For the Planter.

Tobacco the Bane of Virginia Husbandry.

NO. 2.

In my first number the process of tobacco-making was brought through to the burning, sowing, covering, and enclosing the plant patches for the new crop; while the old crop was in the houses, where it had been fire-cured, struck down, "in case," and packed away in bulk, thickly covered with straw, to keep it in order for stripping—an in-door work always ready to be performed in the bad weather of winter,—and is exultingly claimed by tobacco makers as a signal advantage in its culture, an advantage which will be seen to be more than counterbalanced by other usages incidental to the year's operations; but in any event, the old crop must be gotten out of the way before the new crop is ready to come into the houses. Here we left both crops on hand at the same time, a conjunction of double trouble, incident to no other crop but tobacco, for the reason that it requires a year and a half for its completion, while all other crops require only a year. But here, as already said, we left both crops on hand at the same time—the young plants to be watched, nursed and pushed forward in the plant-patches and the old crop of cured tobacco in the houses to be sorted, stripped, and packed down for prizing or to be sold loose as the case may be.

Formerly, all tobacco was prized into hogsheads, and carried to a public warehouse, there to be inspected by legally appointed officers before it was offered for sale; but now it is often bought up and taken at the tobacco houses as soon as it is stripped, and carried by the purchaser to his neighboring factory whence the manufactured article is sent through the length and breadth of the land.

For the present, the chief supply for foreign markets is manufactured at the great tobacco marts—Richmond and Lynchburg, and a few other towns; but the smaller factories which are springing up in and convenient to the few remaining fresh and unexhausted districts of virgin soil of the State, which alone produces the finest tobaccoes, will intercept the abundant supplies which have of late years erected tobacco buildings in the metropolis of Virginia, rivaling in magnitude and exceeding in numbers the adjacent cotton factories of Manchester, and falling but little behind our unrivalled flour mills in commercial importance. Nevertheless, from the working of the smaller factories and the elements of instability and destructiveness inherent in this product of

Virginia agriculture great changes are inevitable, and at no distant day, as will be more fully shown in the sequel.

But before we return to the new crop in the plant-patches, remembering the dangers of the fly and retarding influence of dry spells, to be watched and prevented by the means already detailed in the preceding number, we must here dismiss the details of managing the crop already in the houses, and take up the operations which demand attention for the new crop.

In the tobacco-making parts of Virginia (for there is far less than a moiety of the State now engaged in cultivating this ruinous crop)—"tobacco land," is as familiar as any household word; meaning rich land—it being well understood that none other than rich land, pays for cultivation in tobacco.*

Thus, the best land, as a matter of course, is selected for tobacco, and whether this is new forest land to be cleared, or old land to be manured (for no old land is ever put in tobacco without manure or some other improvement) the very best is usually selected. The plows are first started in the old land intended for tobacco—this is deeply plowed and left to the ameliorating influences of the winter's frost. The new ground being grubbed and cleared, is thoroughly broken up with the new-ground coulters, raked and the torn-up roots of the forest growth and brush burnt off, is ready for hilling. This hilling process is performed by hand-work, with *hilling hoes*—an implement made for the purpose, differing from the common weeding hoe, and leaves the earth in perfect tilth to receive the young plants when ready to be set out.

While the two crops are thus both on hand, the one being handled as already described in the houses, while the other is being pushed forward for planting, with the supremacy with which tobacco exacts attention above all other matters, it would be regarded as next to insanity to think of any thing else, until the operations above described have been provided for and performed before any thing else. A practical mind will see at a glance how this monopoly of labour and manure must starve all the other departments on a tobacco plantation.

This double pressure of two tobacco crops upon hand the first six months of the year, leaves so little time for the corn crop and oats, as necessarily leads to haste and neglect in providing for them, and whatever "is hastily done, will be badly done." And here especially at this juncture, may be seen how the tobacco starves the others by its pressing demands, to which all other demands give place for all the labour of the plantation to do the important work of hilling—and thus oats sowing and corn planting is hurried out of the way to give place to hilling for tobacco. The hilling of old ground is never done until plowed a second time after the winter plowing—and before this second plowing, the manure is hauled and spread, in order to be thoroughly mixed with the soil by the double operation of plowing and hilling—all which will serve to show there is nothing known in field culture, more elaborately done than the preparation for a crop of tobacco by a regular trained skilful tobacco maker in Virginia. It is no wonder then, that a crop requiring so much labour, and by universal usage having precedence over all other crops on hand, should starve the others; and itself being neither meat, drink, or clothing for man, or provender for stock, should also starve, (or stint at least) both man and beast. To prove the alledged charge against tobacco as the bane of Virginia husbandry, it is only necessary here to show up some of its prominent features, which will be readily recognized by all acquainted with the system. Good husbandry, as applied to agriculture, is such a course of tillage, as affords the largest share of profit and comfort from the products of the soil, and furthermore affords a reasonable prospect of maintaining if not increasing the productive powers of the earth for an indefinite time. To admit a regular diminution in productiveness, leads to ultimate sterility, and impugns the beneficence of Divine Providence in creating the earth with properties destined ultimately to entail starvation upon them.

A proper farming system embraces the largest practical range of the productions of the earth, tobacco-planting being confined to one, is therefore the very antagonism of farming,

Note.—In illustration of this truth as well as the more melancholy fact, of the exhausted state of the old tobacco districts, there may sometimes be seen along the margin of a public road for the distance of half a mile or more, a string of tobacco 3 or 4 rows wide, occupying the lately vacated space of a wrom-fence which had protected the narrow slip from the ruin of the tobacco system.

and where it is the chief crop, little else except Indian corn is cultivated.

A few of the results as applicable to Virginia practice are as follow:

Farmers produce their own meat and bread, with some to spare for supplying the nearest market town.

Tobacco planters buy a large portion of their meat from our western drovers, and often not a small part of their bread, from such of their neighbours as are getting wise enough to make a surplus of corn—a plenty of which makes every thing plenty, and a scarcity of which makes every thing scarce, upon a Virginia plantation.

Farmers can afford to spare manure to keep a grass lot or an acre or two of meadow, which give all the rich comforts of a dairy, besides the healthful supplies of the garden and truck patch—what is over going to the corn and wheat crops.

Tobacco planters will hardly spare a bushel of manure from the insatiable tobacco crop, to help to make a square in the garden rich enough for Irish potatoes.

Examples may be cited from that class of our tobacco-makers (from 2 to 10 Hhd. men) of the whole nett proceeds of their tobacco crops being paid for the bread-corn for the year's use of their families. This, doubtless, is an extreme case—but an approximation to it is common. Thus the most laborious crop known to agriculture, the most exhausting of the soil, and requiring the most manure is voluntarily undertaken for a full year and a half to make bread and meat for the producers family one year, while every Tyro in agriculture sees at a glance, that the same amount of labour and manure in one year's application would give more than amply sufficient bread and grain to raise the meat for the year's supply of the plantation, and save the 6 months of surplus labor on the tobacco crop. Verily this looks like infatuation entailed upon our suffering country by this deleterious staple. But to proceed with the farther details of the tobacco crop. Before the hilling process is over, the plant-patches must be uncovered, hand-weeded and topped-dressed—and if necessary, watered from time to time that all may be ready as early as possible for "planting out." And here a few minor troubles may be mentioned. The spring seasons are more unpropitious by reason of droughts than formerly—consequently it is not uncommon to water each plant in the hill, or after a light season, to cover each plant with a clod of the soil, which has to be watered, and taken off in time, lest remaining too long the young plant becomes coddled. This is one of the extra troubles incident to a bad planting season—but another of the same sort may be mentioned here, as the morality of the culture is intended to be adverted to in the sequel. From time immemorial in the history of tobacco, it has been the practice, when a moderate rain falls on a Saturday night, to plant on Sunday morning rather than run the risk of losing the season, at a critical period of the year. As soon as the plants are fairly rooted in the hills, the process of ridging down by the hand-hoes, which scrapes the soil down and leaves the plant clear of grass, is soon followed by ploughing between the rows, throwing the soil back again to be followed before the grass has time to spring by second hilling to the plants. In the meantime, such a preparatory and nursing process has pushed the crop into a rapid growth, and a portion will require priming taking off the bottom dwarf leaves, and topping, leaving the regular number of leaves to each plant (which may be assumed at 8.) This work of topping is performed by particular hands trained for the purpose, and is executed with astonishing adroitness. Tobacco plantation-hands who cannot count 50 will acquire a sort of instinct which enables them to top tobacco with invariable correctness almost as fast as they can walk along the row. After topping, a new trouble begins—at the foot-stalk of each leaf there are three embryo buds, which as soon as the ascending sap to the top is arrested by topping, spring into rapid growth, forming the suckers, which must be taken off, as soon as possible after they grow of size sufficient to be laid hold upon, as these three crops of suckers show themselves in succession, they require constant vigilance to keep them down the greater part of the growing season of the crop, nor is this the only or most formidable trouble of the growing crop. The tobacco-worm, though not always equally destructive is always sufficiently so to require a thorough examination of every plant once in a week or ten days, and here begins a system of vigilant police, to keep down the suckers and destroy the tobacco-worms, which is unparalleled in the history of any other crop, requiring the examination of the whole of every superficial inch of the surface of every leaf in the crop to destroy the eggs and young worms once in every week or ten days, for an egg will hatch and the young worm spoil a leaf in that time.

Soon after topping comes the second plowing, to be followed by the third hilling up. These are the regular operations when seasons are good and run in regular order, but when untoward, as in extraordinary floods or droughts these are provided for by extraordinary operations, such as deep coulterings to long droughts, or an additional plowing when the earth has been settled together by heavy rains and baking weather.

And now follows the cutting operation. The sticks being prepared and the scaffolds ready, it is only the plantation veterans who are sufficient judges of the ripeness of the plants to be trusted with the cutting.

It is a peculiarity of the tobacco, which increases the labour and trouble of saving it more than any other crop, that it does not ripen all at once like grain and grass, but in succession, requiring to be saved through a protracted period sometimes of several weeks. Here again is additional trouble not incident to other crops.

The plants when cut fully ripe, are so brittle that the leaves break off like glass until they are in some degree wilted by the sun, and must therefore be carefully handled; but furthermore, when the weather is hot and the earth dry, must be covered with green bushes to guard against sun-burning which once taking place, the leaf as far as it extends is ruined by it; this sun-burning is another evil in the tobacco-making which requires no little additional labour to guard against, by providing the green bushes and herbage to shade the fresh cut plants, both in the field and on the scaffold.

And now the housing commences, after the plants have hung a few days upon the out-door scaffolds, but here it must be watched also, for here it is liable also to be sun-burnt, and therefore must be protected by bush arbours until thoroughly wilted for convenient handling in the next operation of hoisting and placed upon the tiers in the houses, usually 20 feet square, made of sound logs and carried high enough to afford 4 tiers below joists (inclusive,) to fire under, with close, tight roofs. The out-door scaffolds are made of sapling poles from 20 to 40 feet long, resting upon strong forks let into the ground, so as to support the poles 4 or 5 feet above the surface, and in parallel lines ten feet apart, so that a fence rail eleven feet long will span the interval between the poles, and a foot over to lap upon them—these rails are placed 4 feet apart to suit the length of the rived sticks upon which the tobacco plants are hung, in number from 8 to 12, and these sticks, with their quota of plants placed with their ends resting on the fence rails, at intervals of a foot from each other; this affords data upon which may be calculated the amount of sticks and scaffolding necessary to provide for a crop of any given size.

From these outside scaffolds after being duly wilted, the tobacco is taken, stick by stick, and hoisted to the tiers prepared to receive it inside the houses, when the firing process forthwith commences. This can only be done in the most approved way, with the best fuel, hickory or oak, cut, hauled to the houses the preceding winter, it being found to be best to be half-seasoned. This firing process being critical and dangerous, is intrusted only to the most steady and careful hands, and with all possible diligence, results in the burning of many tobacco-houses yearly.

The fuel is laid in lines of logs across the tobacco-house floor under the tails of the suspended tobacco upon the tiers above, and after closing every crevice of the house, and a tight door, is simultaneously set on fire by a number of hands and very soon heats the house to a very high degree. This, after some hours, dries the tobacco to a crisp state, and in this state is liable by a sudden blast of wind blowing up a spark, or the falling of a stick to set fire to the inflamable mass above, which explodes like a powder magazine. This risk of firing has to be run at least two or three times in every house during the curing season before it is thoroughly prepared to be struck down and put away in bulk for stripping. This brings up the new crop to the stage where we left the old one, which, in the meantime, must be handled, prized, and sent to market to give room for the new crop, when ready to be struck down and bulked for stripping.

We shall conclude this number at this stage of the process of tobacco-making. Nothing doubting, that if the foregoing account does not fully satisfy every partial agriculturist that it is the most laborious and troublesome of all crops, by the time we have reached the end of our next number, all doubts may be removed.

JOHN H. COCKE.

For the Southern Planter.

Guano Controversy.

January 17th, 1859.

Mr. Editor,—In the January No. of the Planter, your correspondent, "B.," while he expresses his entire approbation of my views in regard to the nutritive and fertilizing properties of guano, takes exception to some of my positions in vegetable physiology. As this is a side issue, and not much practical knowledge is likely to grow out of its discussion, we might very well leave it for the further research and investigation of vegetable physiologists. But, for the sake of a clearer understanding of what I did write, and setting myself right in the premises, I will briefly notice one or two of his objections.

Im primis. "B" objects to my conclusion that plants are not susceptible to the action of *mere* stimulants, because I do not "apprehend" the modus operandi, and says, "if the fact be a fact, that plants are thus acted upon, there certainly is a *mode*, whether I *apprehend* it or not." If the fact, be not a fact, how then, "Mr. B.?" May I not be excused for not "apprehending" how it could be a fact, without the knowledge of the existence of such an organism as we know to exist in the animal creation where we do "apprehend" the "mode?" I contend, that the existence of a nervous system is essential to the development of such an effect, because, all the *positive phenomena* of such action, are found in connection with such a known system. If "B" then, will prove that plants possess such organs, I will admit that they are susceptible to the action of *mere* stimulants; or, if he will prove that they are capable of being thus acted upon, I will admit the existence of such a system pervading their organization. So to conclude with this objection, I neither "apprehend" the *mode* of such action, nor know of the existence of any fact tending to establish a belief that any such effect can be produced.

In the next place: "B." quotes my definition of a stimulant in its broad and extended sense, to be an "agent that exalts and quickens the vital manifestations or forces." Now, it is very obvious, as he says, that plants have vitality; and that this vitality can be exalted and quickened. If it were not so, it would be useless to attempt to nourish them or cause them to grow by the application of manures and all other agents that tend to their development. But it is one thing to increase the functions of organic life; causing growth, and development, and another thing to stimulate an action that is unattended with nutrition, growth, or development. Both of these efforts can be produced upon animal life, only the former upon vegetable life, and if "B" will look over my article again, he will find that I illustrated this by the effects of nutritious food and the diffusible and transient excitement of brandy, opium, musk, camphor, *et id omne genus;* agents that are powerful when applied to a system of nerves: but innoxious to plants. So a difference must be made in stimulants that exalt the functions of organic life and those that act *merely* upon the nervous system.

Again: "B" objects to my physiology. In maintaining that sensation and locomotion are as cause and effect. I confess that I have no authority for such a position; but, still believe it to be true enough, for all the purposes of my argument. I did not use the term *locomotion* in its literal sense; that is, meaning a change of place; but merely motion. So far as the calls of nature which we call sensation are concerned, you will find motion to be commensurate with them. For whence the necessity of a sensation without the power to respond to it, or whence the necessity of a power, without the sensation to call it into action. But, says the gentleman, that some vegetables are so like animals, and some animals are so like vegetables, that it is impossible to tell where the one kingdom stops and the other begins. And asks me for the "stand point." I know of no stand points in nature. It is thus in all the departments of nature. One species losing its identity by insensible degrees, and another assuming an identity by equally insensible degrees. Do we not observe all the phenomena of a nervous system grow less and less perceptible as the characteristics of animal life diminish? And on the contrary in the highest order of vegetable existance, do we not discern many of the peculiarities of the animal kingdom and two of the most striking of these are sensation and voluntary motion, whenever discernable; they are evidences of animal life whenever absent; we are on the confines of the vegetable kingdom.

Again: "B." in support of his doctrine that vegetables possess excitability; (independant of that which is common to all things possessing vitality;) calls our attention to the action of the sun upon the sunflower. I hope I am not so stubborn an unbeliever as Bishop Berkly, who could not convince himself of the reality of a carriage in the street, until it had run over him. But with respect to many of the popular opinions of the day, I claim the privilege of withholding my assent. So far as my observation goes, I have seen as many sunflowers with their disks turned from the sun as towards it; and am inclined to the opinion that its relative position is owing more to the way in which the winds have reached it than the sun. But, should it be a fact, and if "B" has any great regard for the ancient faith that is within him, I will not dispute it. Is it necessary to endow this plant with such a piece of exquisite machinery as a nervous system, to keep its face turned both to the rising and the setting sun. If this be the case, it is not remarkable that it, and his other little pet, the sensitive plant, should be singled out from the whole of the vegetable creation, as most worthy of the special admiration of poets and romance writers. Nor can I help suspecting "B." of having something of this feeling, when he descants about the "leafless tree and torpid toad being awakened to life by the stimulating influence of a vernal sun." How like Virgil and Thompson! "B." has certainly felt the influence of the "gift divine," and will not like his little divinities to be stripped of their godlike attributes. But, as I have never yet felt the stirrings of such an influence, I am compelled to seek my causes for such phenomena, in some of the greater forces of nature; though it be laying the ruthless hand of a mere truth searcher upon some of the most beautiful creations of poetry.

All the changes and motions in nature are the result of the operations of a few great forces, and none of these are of more potency than heat; and as the sun is the greatest of all natural sources of heat, why may it not be able to produce these insignificant effects upon the sunflower, and the so called sensitive plant, without this special arrangement of a nervous system. It is the great power of destruction and construction. It upheaves mountains and overthrows them again; causing them to belch forth fire and smoke. It melts down mountains of ice, and causes them to flow like rivers of water; it dissipates rivers of water into thin air, and bears it on the wings of the wind to the uttermost parts of the earth, and yet it cannot bow the stiff neck of the sunflower, or cause a delicate plant to shrink, without the intervention of the machinery of a nervous system.

In conclusion, I thank "B." for the complimentary manner in which he was pleased to speak of my communication, and would like very much to know something more of his "personel" than I can find out from the simple soubriquet of "B." I hope his modesty will not prevent, when he communicates again upon any subject, giving us the benefit of his name. I can see no reason why it should, as he writes both well and sensibly. But should it again prove too much for him, I will be satisfied to receive his autograph to the address of Wm. A. Bradford.

Millwood, Clark Co., Va.

For the Southern Planter.

Farm-Yard Manure.

Mr. Editor:

Recent numbers of the Journal of the Royal Agricultural Society of England contains a long and very valuable essay, by Prof. Voelcker of the Royal Agricultural College of England, upon the composition of farm-yard manure in every stage of its decomposition. The essay is encumbered by many analytical details, and other matters not interesting to the general reader, or necessary to the practical man, making it too long for republication in our agricultural journals. As he establishes some important truths in relation to farm-yard manure, I take the liberty of presenting its main features to the readers of the Planter, with the hope that it may prove of practical advantage to some, and of more or less interest to all.

The manure experimented upon, was composed of the mixed droppings of horses, cattle and hogs, mixed with the straw that had been used as litter, and very thoroughly worked over, so as to ensure a manure of uniform composition.

The first analyses were of the fresh manure, when it was only some two weeks old;

the manure in this condition gave the following general results:

	In nat'l state.	*Calt'd dry.*
Water	66.17	——
*Soluble organic matter	2.48	7.33
Soluble inorganic matter	1.54	4.55
†Insoluble organic matter	25.76	76.15
Insoluble inorganic matter	4.05	11.97
	100.00	100.00

	In nat. st.	*Dry.*
*Containing nitrogen	.149	.44
Equal to ammonia	.181	.53
†Containing nitrogen	.494	1.46
Equal to ammonia	.599	1.77
Total percentage of nitrogen	.643	1.90
Equal to ammonia	.780	2.30

A delicate reddened litmus paper held over the fresh mixed dung was not affected at first, but after the lapse of a couple of hours it was slightly changed to blue, thus showing that this fresh dung contained but a very small quantity of free, or properly speaking, volatile carbonate of ammonia, for it is in the state of carbonate that ammonia is generally given off from putrifying substances.

On subjecting the fresh manure to analysis for ammonia, the percentage of free ammonia was found to be:

In natural state.	*Calculated dry.*
.034	.10

Ammonia in the state of salts:

In natural state.	*Calculated dry.*
.088	.26

The amount of volatile ammonia, as well as ready formed ammonia, existing in the form of ammoniacal salts in fresh manure, thus appears to be very trifling.

Since there exists no complete, trust-worthy analysis of the ash of fresh farm-yard manure, I thought it advisable to analyse separately the soluble and insoluble portion of the inorganic matters present in fresh farm-yard manure.

One hundred parts of the soluble and insoluble inorganic matters in fresh farm-yard manure were found to have the subjoined composition:

Soluble in Water—27.55 per cent.	
Soluble silica	4.25
Phosphate of lime	5.35
Lime	1.10
Magnesia,	0.20
Potassa	10.26
Soda	0.92
Chloride of sodium	0.54
Sulphuric acid	0.22
Carbonic acid and loss	4.71
Carried forward	27.55
Brought forward	27.55
Insoluble in Water—72.45 per cent.	
Soluble silica	17.34
Insoluble silicious matter (sand)	10.04
Phosphate of lime	——
Oxide of iron and alumina with phosphates	8.47
Containing phosph. acid	(3.18)
Equal to bone earth	(6.88)
Lime	20.21
Magnesia	2.56
Potassa	1.78
Soda	0.38
Sulphuric acid	1.27
Carbonic acid and loss	10.40
	100.00

The following table represents the detailed composition of fresh farm-yard manure:

Water		66.17
*Soluble organic matter		2.48
Soluble inorganic matter (ash)	——	
Soluble silica	.237	
Phosphate of lime	.299	
Lime	.066	
Magnesia	.011	
Potash	.573	
Soda	.051	
Chloride of sodium	.030	
Sulphuric acid	.055	
Carbonic acid and loss	.218	
	——	1.54
†Insoluble organic matter		25.76
Insoluble inorganic matter (ash)	——	
Soluble silica	.967	
Insoluble silica	.561	
Oxide of iron, alumina, with phosphates	.596	
Containing phosphoric acid	(.178)	
Equal to bone earth	(.386)	
Lime	1.120	
Magnesia	.143	
Potash	.099	
Soda	.019	
Sulphuric acid	.061	
Carbonic acid and loss	.484	
	——	4.05
		100.00
*Containing nitrogen	.149	
Equal to ammonia	.181	
Containing nitrogen	.494	
†Equal to ammonia	.599	
Whole manure contains ammonia in free state	.034	
Ammonia in the form of salts	.088	

Fresh farm-yard manure being composed of the droppings of horses, cattle and hogs, and the straw used for litter, according to the above determination, in round numbers, consists of two-thirds water, and one-third of dry matter. Since this fresh manure was not more than two weeks old, and no rain had fallen during the time it had lain in the dung pit, all the water is due to the urine and the moisture of the droppings and litter.

The quantity of straw employed as litter must necessarily affect the general composition of fresh dung, and more especially the amount of moisture which it contains; but I believe we are not far wrong by saying that fresh mixed dung, in the production of which litter has been liberally supplied to the animals, when free from rain, consists of one-third dry matters and two-thirds of moisture.

An inspection of the analytical results just mentioned will further bring to view several interesting particulars:

1. *In fresh dung the proportion of soluble organic and mineral matters is small.*— This circumstance fully explains the slow action of fresh dung when compared with the effect which well rotted manure is capable of producing.

2. The proportion of insoluble matters, more especially of insoluble organic matters, in fresh dung, on the contrary is very large. By far the larger proportion of the insoluble organic matters consists of straw changed but little in physical character and chemical composition.

In the simple manure analysed, the amount of insoluble organic matters is ten times as great as that of soluble organic matters, and the proportion of soluble mineral substances nearly three times as large as the amount of soluble mineral matters.

3. Fresh dung contains a mere trace of ammonia in a volatile state of combination, and but a trifling quantity of ammonia in the form of ammoniacal salts.

4. The total amount of nitrogen contained in the *soluble* portion of fresh manure likewise inconsiderable; most of the nitrogen which, as we shall see by and by, is gradually liberated as the fermentation of the dung progresses, is contained in the portion of manure which is insoluble in water. In other words, comparatively speaking, little nitrogen exists in fresh dung in a state in which it can be assimilated by the growing plants. Thus in the sample analysed, the readily available amount of nitrogen in 100 lbs. of fresh dung is only .149 of a lb., whilst about four times as much nitrogen, or, in exact numbers, .494 lb., occurs in the insoluble portion of 100 lbs. of fresh dung.

5. A comparison of the composition of the organic soluble matters with the composition of the organic insoluble matters of fresh dung, however, shows that the former are far more valuable than the latter, inasmuch as the soluble organic matters contain a very large percentage of nitrogen, and in a state of combination in which nitrogen is available to the immediate use of plants.

This will appear from the following numbers:

100 parts of soluble matters in fresh dung, contain 6.04 of nitrogen. 100 parts of insoluble matters in the same dung contain 1.92 of nitrogen. In the same weight of each there is thus more than three times as much nitrogen in the soluble organic matters as in the insoluble.

6. With respect to the inorganic or mineral constituents of fresh dung, it will be seen that it contains all those mineral matters which are found in the ashes of our cultivated plants.

7. Comparing the composition of the soluble inorganic matters with that presented by the insoluble, no essential difference *qualitatively* is perceived between them, for the same constituents which occur in the soluble are found also in the insoluble ash. But there exists a striking difference in the quantitative composition of the soluble and insoluble mineral matters of fresh dung.

8. The principal constituent of the soluble ash of fresh dung, so far as quantity is concerned is *potash;* 100 parts of soluble ash, it will be seen, contain no less than 37.26 parts of real potash, or a quantity which is equivalent to 54.7 of pure carbonate of potash. The analysis of the soluble portion of the ash gave only 14 per cent. of carbonic acid, including the loss in analysis; and as 37.26 of potash take up 17.5 of carbonic acid in becoming carbonate of potash, and moreover much of the soluble lime existed in the solution as bi-carbonate of lime, it is evident that a considerable quantity of potash is united with silica in the soluble ash. The large percentage of soluble silica confirms this view; fresh farm-yard manure thus contains much soluble silicate of potash.

9. The large amount of soluble silica, both in the soluble and insoluble ash, are deserving of notice. In the soluble ash this silica is united principally with potash, and probably also with some soda; in the insoluble ash it is combined chiefly with lime, or exists in a finely divided state, in which it is readily soluble in dilute caustic potash.

10. The most prominent constituent of the soluble ash of fresh dung is silicate of potassa.

11. The most prominent constituent of the insoluble ash is lime.

12. It is particularly worthy of notice that the soluble ash of even *perfectly fresh* dung contains a very *high percentage of phosphate of lime.*

The proportion of phosphate of lime in the soluble portion of ash was in fact found to amount to no less than 19½ per cent of the whole soluble ash, whilst the percentage of phosphate of lime in the insoluble ash was found to be only 9½.

13. *Chemically considered farm-yard manure must be regarded as a perfect and universal manure.* It is a universal manure, because it contains *all* the constituents which our cultivated crops require to bring them to perfection, and is suited to almost every description of agricultural produce.

As far as the inorganic fertilizing substances are concerned, we find in farm-yard manure, potash, soda, lime, magnesia, oxide of iron, silica, phosphoric acid, sulphuric acid, chlorine and carbonic acid—in short, all the minerals, not one excepted, that are found in the ashes of cultivated crops.

Of organic fertilizing matters, we find in farm-yard manure some which are readily soluble in water, and contain a large proportion of nitrogen, and others insoluble in water and containing, comparatively speaking, a small proportion of nitrogen. The former readily yield ammonia, the latter principally give rise to the formation of humic acids and similar organic compounds. These organic acids constitute the most of the brown vegetable substance, or rather mixture of substances, which practically speaking, pass under the name of humus.

Farm-yard manure is a perfect manure, because experience as well as chemical analysis shows that the fertilizing constituents are present in dung in states of combination which appear to be especially favorable to the luxuriant growth of our crops. Since the number of the various chemical compounds in farm-yard manure is exceedingly great, and many no doubt exist in a different state of combination from that in which they are obtained on analysing farm-yard manure, in our present state of knowledge it is impossible artificially to produce a concentrated, universal, and perfect manure, which might entirely supersede home-made dung.

ROTTEN FARM-YARD DUNG.

With a view of ascertaining the changes which farm-yard manure undergoes in keeping, I submitted to analysis a well mixed sample of rotten dung produced under the same circumstances under which the fresh manure was obtained. The rotten probably was at least six months old, possessed a dark brown, almost black, color, and appeared to be well fermented, short dung.

The general composition of this dung is presented in the subjoined table:

	In nat'l state.	*Calt'd dry.*
Water	75.42	——
*Soluble organic matter	3.71	15.09
Soluble inorganic matter	1.47	5.98
†Insoluble organic matter	12.82	52.15
Insoluble inorganic matter	6.58	26.78
	100.00	100.00
*Containing nitrogen	.297	1.21
Equal to ammonia	.360	1.47
†Containing nitrogen	.309	1.26
Equal to ammonia	.375	1.53
Total nitrogen	.606	2.47
Equal to ammonia	.735	3.00

I have determined in this manner likewise the proportion of ammonia present in a volatile form, as well as the ammonia in the form of salts, and have obtained the following results:

	In nat'l state.	*Calt'd dry.*
Free ammonia	.046	.189
Ammonia in the form of salts	.057	.232

The proportion of free ammonia in well-rotted dung thus appears not much larger than in fresh dung produced under the same circumstances; and the amount of ammonia present in rotten dung in the form of salts, which are readily decomposed by quicklime, to be almost identical with that contained in the fresh manure.

The detailed analyses of the soluble and insoluble ash of this manure, together with the composition of the whole manure in its natural state we must omit.

A comparison of these analytical results with the numbers obtained in the analysis of fresh manure, exhibits several striking differences.

1. The well-rotted dung contains nearly 10 per cent. more water than the fresh. The larger percentage of water, it is true, may be purely accidental; but, considering the tendency of the liquid excrements to sink to the lower part of the manure pit in which the rotten dung accumulates, I believe rotten dung will always be found more moist than fresh dung upon which no rain has fallen.

2. Notwithstanding the much larger percentage of moisture in the well-rotten dung, it contains in its natural state, with 75½ per cent. of water, almost as much nitrogen as the fresh dung, with only 66 per cent. of moisture. Supposing both to be equally moist, there would thus be considerably more nitrogen in rotten dung than in an equal weight of fresh. This is clearly observed by comparing the total amount of nitrogen in the perfectly dry fresh and rotten dung. In the former it amounts to 1.90 per cent. of nitrogen, in the latter to 2.47. As far as this most invaluable element is concerned, farm-yard manure becomes much richer, weight for weight, in becoming changed from fresh into rotten dung.

3. During the fermentation of the dung the proportion of insoluble organic matters greatly diminishes; thus the dry fresh manure contained 76 per cent. of insoluble organic matters, whilst there were only 52 per cent. in the dry rotten dung.

4. It is especially worthy of observation that, whilst the insoluble organic matter is much reduced in quantity during the fermentation, the insoluble organic matter which remains behind in rotten dung is richer in nitrogen than an equal quantity of insoluble organic matter from fresh dung. Thus 76 per cent. of insoluble organic matter of fresh dung contain 1.46 per cent., whilst 52 per cent. of it from rotten dung very nearly contain the same quantity, viz: 1.26. Or:

100 parts of insoluble organic matter from fresh dung contains of nitrogen,	1.92
100 parts of insoluble organic matter from rotten dung contain of nitrogen,	2.41

5. On the other hand, the relative proportion of insoluble inorganic matters increases much during the fermentation of the dung, since dry fresh dung contains about 12 per cent. of insoluble mineral matters, and dry well-rotten dung 26.8 per cent., or more than double the amount which is found in fresh dung.

6. But perhaps the most striking difference in the composition of fresh and rotten dung is exhibited in the relative proportions of soluble organic matter. Well-rotted dung, it will be observed, contains rather more than twice as much soluble organic matters as the fresh; with this increase the amount of nitrogen present in the soluble state rises from .44 to 1.21 per cent.

7. Not only does the absolute amount of soluble nitrogenized matters increase during the fermentation of dung, but the soluble organic matters relatively get richer in nitrogen also. Thus:

100 parts of dry organic soluble matter from fresh dung contain of nitrogen,	6.14
100 parts of dry organic matter from rotten dung contain of nitrogen,	8.02

8. Lastly, it will be seen that the proportion of soluble mineral matters in rotten dung is more considerable than in fresh.

9. On the whole, weight for weight, well-rotted farm-yard manure is richer in soluble fertilizing constituents than fresh dung, and contains especially more readily available nitrogen, and therefore produces a more immediate and powerful effect on vegetation.

Bearing in mind the differences observable in the composition of fresh and rotten dung, we can in a general manner trace the changes which take place in the fermentation of dung. Farm-yard manure, like most organic matters or mixtures in which the latter enter largely, is subject to the process of spontaneous decomposition, which generally is called fermentation, but more appropriately putrefaction. The nature of this process consists in the gradual alteration of the original organic matters, and in the formation of new chemical compounds. All organic matters, separated from the living organism, are affected by putrefaction,—some more readily, others more slowly. Those organic substances which, like straw, contain but little nitrogen, on exposure to air and moisture at a somewhat elevated temperature decompose spontaneously and slowly, without disengaging any noxious smell. On the other hand, the droppings of animals, and especially their urine, which is rich in nitrogenous compounds, rapidly enter into decomposition, producing disagreeable smelling gases. In a mixture of nitrogenous substances and organic matters free from nitrogen, the former are always first affected by putrefaction; the putrefying nitrogenized matters then act as a ferment on the other organic substances, which by themselves would resist the process of spontaneous decomposition much longer. Without air, moisture, and a certain amount of heat, organic matters cannot enter into putrefaction. These conditions exist in the droppings of cattle and the litter of the stables, hence putrefaction soon affects fresh dung. Like many chemical processes, putrefaction is accompanied with evolution of heat. Air and water exercise an important influence on the manner in which the decomposition of organic matters proceeds. Both are absolutely requisite in order that putrefaction may take place, while perfectly dry organic substances remain unaltered for an indefinite period. But too large an amount of water, again, retards their spontaneous decomposition, as it excludes the access of air and prevents the elevation of temperature, both of which conditions greatly increase the rapidity with which organic matters are decomposed. Although air is an essential element in the putrefaction of organic matters, yet its unlimited access is unfavourable to this process of spontaneous decomposition, and is productive of new changes. In farmyard manure the unlimited access of air is prevented by the compact nature of dungheaps, (consequently only a limited quantity of air can find its way into the interior of the mass.) During the fermentation of fresh dung disagreeable gases are going off. These arise principally from the sulphur and from the phosphorus of the nitrogenized compounds present in dung. A considerable portion of this sulphur and the phosphorus combine with the hydrogen, and form sulphuretted and phosphoretted hydrogen—two extremely nauseous gases, which both escape from fermenting dung heaps. Another portion of the sulphur and the phosphorous unites with atmospheric oxygen, and in the presence of porous substances, becomes changed into sulphuric and phosphoric acid, two non-volatile compounds, which are left behind.

We have seen the relative proportion of inorganic matters in well-rotted dung is much greater than in fresh. This increase in mineral matters can only have been produced at the expense of organic substances, the quantity of which during the process of fermentation must decrease in a corresponding relative degree. Thus the total amount of organic and inorganic matters in fresh dung, dried at 212° Fahr., is:

Organic matters	83.48
Inorganic matters	16.52
	100.00

Whilst in rotten dung there are in 100 parts:

Organic substances	68.24
Mineral substances	31.76
	100.00

It is clear, therefore, that, during the fermentation of dung much of the organic matter must become changed into compounds which are either readily soluble in water, and easily washed out by heavy rains, or into gaseous products, which are readily volatilized. In point of fact, both volatile gases and readily soluble organic compounds are formed. Amongst the former, carbonic acid and ammonia deserve especial mention; amongst the latter, soluble humates and ulmates may be named. These ulmates and humates are dark brown coloured compounds of humic and ulmic acids, with the alkalies, potash, soda, and ammonia. Ulmic and humic acids in a free state are scarcely soluble in water, and for this reason colour it only light brown. These organic acids have a very powerful affinity for ammonia, in consequence of which they lay hold of any free ammonia which is generated in the fermentation of dung, and fix it perfectly, as long as no other compound is present or produced in fermenting dung, which at an *elevated temperature* again destroys the union of ammonia with humic, ulmic, and similarly constituted acids. Now, ammonia is generated during the putrefaction of the nitrogenized constituents of dung in large quantities, and would be dissipated into the air much more rapidly than is the case in reality, if there were not formed in the dung itself a group of organic compounds, which act as most excellent fixers of ammonia. I refer to the humus substances which are gradually produced from the non-nitrogenized constituents of dung. In other words, the straw employed as litter during the putrefaction of dung is to a great extent converted into humic and ulmic acids, which fix to a certain extent the ammonia produced from the more nitrogenous excrementitious matters. The pungent smell of fermenting dung, however, shows that the volatile ammonia cannot be fixed entirely by these means. In the causes of this inquiry, I shall point out the reason of this, and content myself in this place by saying, that the proportion of ammonia which passes into the atmosphere from fermenting dung-heaps, and the loss which hereby is occasioned is much less considerable than it is generally assumed to be. In fermenting dung-heaps the carbonaceous constituents at first are changed into humus substances, but these are rapidly oxidized by atmospheric oxygen, and partly changed into carbonic acid, a gaseous substance which in conjunction with carbonic oxide and carburetted hydrogen, is given off abundantly from all putrefying organic matters.

I have endeavoured to describe briefly the principal changes which take place in the fermentation of farm-yard manure. It has been shown:—

1. That during the fermentation of dung the proportion of both soluble organic and soluble mineral matters rapidly increases.

2. That peculiar organic acids, not existing—at least, not in considerable quantities—are generated during the ripening of dung from the litter and other non-nitrogenized organic constituents of manure.

3. That these acids (humic, ulmic, &c.) form, with potash, soda, and ammonia, dark-coloured, very soluble compounds. Hence the dark colour of the drainings of dung-heaps.

4. That ammonia is produced from the nitrogenous constituents of dung, and that this ammonia is fixed, for the greater part, by the humus substances produced at the same time.

5. That the proportion of the sulphur and phosphorus of the excrementitious matters of dung is dissipated, in the form of sulphuretted and phosphoretted hydrogen.

6. That volatile ammoniacal compounds, apparently in inconsiderable quantities, escape into the air.

7. That the proportion of organic substances in fresh dung rapidly decreases during the fermentation of dung, whilst the mineral substances increase in a corresponding degree.

8. That this loss of organic substances in accounted for by the formation of carbonic acid, carbonic oxide, and light corburetted hydrogen, or marsh gas.

9. That the proportion of nitrogen is larger in rotten than in fresh dung.

The practical result of these changes is, that fresh manure, in ripening, becomes concentrated, more easily available to plants, and consequently more energetic and beneficial in its action. It may be questioned, with much propriety,—Is this apparently desirable result attained without any appreciable loss? or is it realized at too great an expense? In other words, is the fermentation of dung, or is it not, attended with considerable loss of really valuable fertilizing substances?

In putting this question, we have to bear in mind that the loss in valuable mineral matters, under proper management, practically speaking, can be avoided, since they are non-volatile, and, therefore, must remain incorporated with dung, if care be taken to prevent their being washed away by heavy falls of rain. We have likewise to bear in mind that, in an agricultural point of view, the carbonaceous, non-nitrogenized manure-constituents do not possess a very high intrinsic value; and that we therefore need not trouble ourselves about their diminution, if it can be shown that it is accompanied with other beneficial changes. The only other constituents which can come into consideration are the nitrogenized matters. The question may therefore be thus simplified: Is the fermentation of farm-yard manure necessarily attended with any appreciable loss in nitrogen?

Any one may ascertain that fermenting dung gives off ammonia by holding over a dung-heap, in active fermentation, a moistened reddened litmus-paper. The change of this red colour into blue sufficiently shows that there is an escape of ammonia. However, this experiment does not prove as much as is sometimes believed; for inasmuch as the most minute traces of ammonia produce this change of colour, the escape of this volatile fertilizing matter may be so small that it is practically altogether insignificant. The comparison of fresh with rotten dung, we have seen already, does not decide whether or not fresh farm-yard manure sustains a loss in nitrogen in becoming changed into rotten manure. Apparently there is a gain in nitrogen, for we have seen that rotten dung contains more nitrogen than fresh. This gain in nitrogen, however, is explained by the simultaneous disappearance of a much larger relative quantity of carbonaceous organic matter. Still the accumulation of nitrogen in rotten dung is important, and hardly to be expected; for, since a considerable portion of the nitrogenized organic matters is changed into ammonia during fermentation, a loss, instead of a gain, in nitrogen naturally might be expected. A much greater loss in nitrogen than is actually experienced would, indeed, take place during fermentation of dung, if this process were not attended with the simultaneous formation within the manure-heap of excellent fixers of ammonia.

FARM-YARD MANURE IN ITS DIFFERENT STAGES OF DECOMPOSITION.

In order to decide the question as to the loss of ammonia during the fermentation of farm-yard manure, a series of analyses in conjunction with direct weighings of dung in various stages of decomposition became necessary. To this end a quantity of the same well-mixed sample of fresh farm-yard manure, the analysis of which is given in the preceding pages, was carefully weighed. The entire crude loss which this experimental heap sustained in the course of time was ascertained by periodical weighing on the weigh-bridge. Simultaneously with these weighings the manure was submitted to analysis, and thus I was enabled not only to determine from time to time the loss in weight which the experimental heap sustained in keeping, but also to ascertain which constituents were affected by this loss, and in what relative proportions.

This manure after exposure from the 1st of November to the middle of February, three months and a half, had the following general composition:

Water	69.83
*Soluble organic matter	3.86
Soluble inorganic matter (ash)	2.97
†Insoluble organic matter	18.44
Insoluble inorganic matter (ash)	4.90
	100.00

*Containing nitrogen	.27
Equal to ammonia	.32
†Containing nitrogen	.47
Equal to ammonia	.57
Whole manure contains ammonia in free state	.019
Whole manure contains ammonia in the form of salts	.064

Estimated Dry.

*Soluble organic matter	12.79
Soluble inorganic matter (ash)	9.84
†Insoluble organic matter	61.12
Insoluble inorganic matter	16.25
	100.00

*Containing nitrogen	.91
Equal to ammonia	1.10
†Containing nitrogen	1.58
Equal to ammonia	1.88

A comparison of these results with the analysis which was made of the fresh manure, will show:

1. That there is more water in the manure than at first.

2. That notwithstanding the larger proportion of water, the soluble organic and mineral matters have become more abundant, whilst the insoluble organic matters have become diminished in quantity.

Thus, on the first analysis, the manure contained 2.48 per cent. of soluble organic matter, and 1.54 mineral substances; and on the second 3.86 per cent. organic and 2.97 mineral substances; whilst the proportion of insoluble organic matters in the first analysis amounts to 25.76 per cent., and in the second to only 18.44 per cent.

These differences are still more striking if we make the comparison with perfectly dry manure. It will then be found that the manure contained:

	1st analy.	2nd analy.
Soluble organic matters	7.33	12.79
Soluble mineral matters	4.55	9.84
Insoluble organic matter	76.15	61.12
Insoluble mineral matters	11.97	16.25
	100.00	100.00

3. The total percentage of organic substances decreases, whilst that of mineral matters increases. Thus the fresh manure contained:

	1st analy.	2nd analy.
Organic matters	28.24	22.30
Mineral matters	5.59	7.87

And the perfectly dry manure:

Organic matters	83.48	73.91
Mineral matters	16.52	26.07

4. That the percentage of nitrogen in the second analysis is slightly greater than in the first.

5. That there is about the same inconsiderable amount of free ammonia, and ammonia in the form of readily decomposable salts, in the manure on the second analysis that was found at first.

In the subjoined table is stated the actual weight of the experimental heap at different periods, and the loss which is sustained in these periods:

	Weight of manure in pounds.	Loss in original weight in lbs.	Percentage of loss.
Put up on the 3d of November..	2838	....	....
Weighed on the 30th of April, after a lapse of 6 months.......	2026	812	28.6
Weighed on the 23d of August, after a lapse of 9 months and 20 days.....................	1994	844	29.7
Weighed on the 15th of November, after a lapse of 12 months and 12 days................	1974	864	30.4

We shall see presently in what this enormous loss consisted.

In the table below will be found the composition of the manure at various epochs, and for comparison, calculated dry:

	When put up. Nov. 3.	Feb. 14.	April 30.	August 23.	Nov. 15.
*Soluble organic matters......	7.33	12.79	12.54	12.04	10.65
Soluble inorganic matters......	4.55	9.81	8.39	8.03	7.27
†Insoluble organic matters......	76.15	61.12	56.49	49.77	42.35
Insoluble mineral matters......	11.97	16.25	22.58	30.16	39.73
	100.00	100.00	100.00	100.00	100.00
*Containing nitrogen......	.44	.91	.88	.77	.72
Equal to ammonia......	.53	1.10	1.06	.93	.88
†Containing nitrogen......	1.46	1.55	1.75	1.92	1.85
Equal to ammonia......	1.77	1.88	2.12	2.33	2.24
Total amount of nitrogen......	1.90	2.46	2.63	2.69	2.57
Equal to ammonia......	2.30	2.98	3.18	3.26	3.12
Ammonia in free state......	.10	.062	.023	.041	.023
Ammonia in the form of salts......	.26	.212	.249	.154	.159
Total amount of organic matters...	83.48	73.91	69.03	61.81	53.00
Total amount of mineral substances.	16.52	26.09	30.97	38.19	47.00

A comparison of these different analyses point out clearly the changes which fresh farm-yard manure undergoes on keeping in a heap, exposed to the weather.

1. It will be perceived that the proportion of organic matter steadily diminishes from month to month, until the original percentage of organic matter in the dry manure, amounting to 83.48 per cent. became reduced to 53 per cent.

2. On the other hand, the total percentage of mineral matters rises as steadily as that of the organic matter falls.

3. It will be seen that the loss in organic matters affects the percentage of insoluble organic matters more than the percentage of soluble organic substances.

4. With respect to the total percentage of nitrogen in the manure examined at different periods of the year, it will be seen that the February manure contains about one-half per cent. more nitrogen than the manure in a perfectly fresh state.

On the 30th of April the percentage of nitrogen again slightly increased; in August it remained stationary, and had sunk but very little when last examined in November.

This series of analyses thus shows that fresh farm-yard manure rapidly becomes more soluble in water, but this desirable change is realized at the expense of a large proportion of organic matter.—It likewise proves in an unmistakable manner that there is no advantage in keeping farm-yard manure too long; for after three and a half months neither the percentage of soluble organic, nor that of soluble mineral matters has become greater.

Weight for weight, the manure in February was equal to that of April or August, and slightly superior to the same manure in November. The direct weighings, however, of the whole heap have shown us already that a considerable loss in weight is experienced in the different periods during which the manure was kept. As the fresh manure did not improve after February, it is clear that the loss of weight is not due to the mere evaporation of water, or the dissipation of other useless ingredients, but is a real loss in valuable fertilizing constituents.

That this is really the case appears still more decidedly if we consult the direct weighings of the experimental heap, and the composition of the manure at the time at which the weighings were made.

In the following table the composition which the whole experimental heap exhibited at different periods of the year, has been calculated from the data already given.—The actual weight of the manure heap is again stated in the first horizontal column; in the second, the actual amount of water in the whole heap is stated; and in the third, the total amount of dry matter. The next year (bracketed together) show the composition of the dry matters. All numbers in the table express pounds or fractions of pounds.

	When put up. Nov'r 3rd.	April 30.	August 23.	Nov'r 15.
Weight of manure in pounds....	2838	2026	1994	1974
Amount of water in the manure....	1877.9	1336.1	1505.3	1466.5
Amount of dry matter in the manure....	960.1	689.9	488.7	507.5
Consisting of:				
*Soluble organic matter....	70 38	86.51	58.83	54.04
Soluble mineral matter....	43.71	57.88	39.16	36.89
†Insoluble organic matters....	731.07	389.74	243.22	214.92
Insoluble mineral matters....	114.94	155.77	147.49	201,65
	960.10	689.9	488.7	507.5
*Containing nitrogen....	4.22	6.07	3.76	3.65
Equal to ammonia....	5.14	7.37	4.56	4.36
Containing nitrogen....	14.01	12.07	9.38	9.38
Equal to ammonia....	17.02	14.65	11.40	11-39
Total amount of nitrogen in manure....	18.23	18.14	13.14	13.03
Equal to ammonia....	22.14	22.02	15.96	15.75
The manure contains ammonia in free state....	.96	.15	.20	.11
The manure contains ammonia in the form of salts....	2.49	1.71	.75	.80
Total amount of organic matters....	801.45	476.25	302.05	268.96
Total amount of mineral matters....	158.15	213.65	186.65	238.54

A careful study of the table will convince the reader that the real loss in valuable fertilizing matters which farm-yard manure sustains in keeping is very much greater than that indicated by the direct weighings of the experimental heap. The total amount of dry matter in the fresh experimental heap amounted to 960.10 pounds, but after having been exposed to the influence of the weather for a period of nine months, only 488.7 pounds of dry substance was left behind. The direct weighing of the heap indicates a loss of 29.77 per cent., whereas in reality a loss of very nearly 50 per cent. in the solid constituents of the manure has been incurred. This *enormous waste* in manuring matters, it will appear likewise from a careful perusal of the table, may be prevented, at least to a very great extent, by applying the manure in a fresh state to the land, or, if this inadmissible, by keeping it no longer than is absolutely necessary.

It will be remarked that in the first experimental period the fermentation of the dung, as might have been expected, proceeded most rapidly, but that, notwithstanding, very little nitrogen was dissipated in the form of ammonia, and that on the whole the loss which the manure sustained was inconsiderable when compared with the enormous waste to which it was subject in the subsequent warmer and more rainy seasons of the year. Thus we find at the end of April very nearly the same amount of nitrogen which is contained in the fresh; whereas, at the end of August, 27.9 per cent. of the total amount of nitrogen, or nearly one-third of the nitrogen of the manure, has been wasted in one way or another.

It is worthy of observation that, during a well regulated fermentation of dung, the loss in intrinsically valuable constituents is inconsiderable, and that by such a preparatory process the efficacy of the manure becomes greatly enhanced. For certain purposes fresh dung can never take the place of well-rotted dung. The farmer will, therefore, always be compelled to submit a portion of home-made dung to fermentation, and will find satisfaction in knowing that this process, when well regulated, is not attended with any serious depreciation in the value of the manure. In the foregoing analyses he will find direct proof that, as long as heavy showers of rain are excluded from manure heaps, or the manure is kept in water-proof pits, the most valuable fertilizing matters are preserved. But let us now see how matters stand when manure heaps, the component parts of which have become much more soluble than they were originally, are exposed to heavy showers of rain.

In the first experimental period little rain fell, and this never in large quantities at a time, whilst in the interval of April and August rain was more abundant, and fell several times in continual heavy showers.—In consequence of this the soluble matters in the heap have been washed out, and with them a considerable portion of available nitrogen, and the more valuable mineral constituents of dung have been wasted.

The above analytical data, if I am not mistaken, afford likewise a proof that even in active fermentation of dung little nitrogen escapes in the form of volatile ammonia, but that this most valuable of all fertilizing materials, along with others of much agricultural importance, is washed out in considerable quantities by the rain which falls on the heaps, and is wasted chiefly in the draining of the dung heaps.

A single fact, it has been truly said, is worth more than a dozen vague speculations. We hear frequently people talk of the loss in ammonia which farm-yard manure undergoes in keeping, and this loss is referred by them to the volatilization of the ammonia which is produced in the putrefaction of the nitrogenized constituents of dung. I have, however, already mentioned that simultaneously with the ammonia, ulmic, humic, and other organic acids are generated from the non-nitrogenized constituents of manure, and that these acids possess the power of fixing the ammonia in an excellent manner. If this were not the case it would be difficult, if not impossible, to explain the circumstance that the proportion of soluble nitrogenized matter increased considerably in the manure on keeping for a period of six months, and that during this period the total amount of nitrogen scarcely suffered any diminution. In April the amount of nitrogen in the soluble matters of the entire heap is 6.07 pounds, and by the 23d of August it is reduced to 3.76 pounds. Why, it may be asked, is it not likely that most of this nitrogen has passed into the air in the form of volatile ammoniacal compounds? In reply to this question I would answer that a loss taking place in this way would be felt much more sensibly in the period of active fermentation, in which, however, we have seen that scarcely any nitrogen is dissipated. In the August and November analyses, moreover, it will be observed that not only the amount of soluble organic matter, and with it that of the nitrogen, decreases, but that the soluble mineral matters, which in April amount to 57.88 pounds in the entire heap, became reduced to 39.16 pounds by the 23d of August. Now, this decrease in soluble mineral substances can only be ascribed to the rain which fell in this period, and it is plain that the deteriorating influence of heavy showers of rain must equally affect the soluble nitrogenized constituents of dung.

In conclusion, it may not be amiss to state briefly the more prominent and practically interesting points which have been developed in the course of this investigation.

1. Perfectly fresh farm-yard manure contains but a small proportion of free ammonia.

2. The nitrogen in fresh dung exists principally in the state of insoluble nitrogenized matters.

3. The soluble organic and mineral constituents of dung are much more valuable fertilizers than the insoluble. Particular care, therefore, should be bestowed upon the preservation of the liquid excrements of animals, and for the same reason the manure should be kept in water-proof pits.

4. Farm-yard manure, even in quite a fresh state, contains phosphate of lime, which is much more soluble than has hitherto been suspected.

5. The urine of the horse, cow and hog, does not contain any appreciable quantity of phosphate of lime, whilst the drainings of dung heaps contain considerable quantities of this valuable fertilizer. The drainings of dung heaps, partly for this reason, are more valuable than the urine of our domestic animals, and therefore ought to be prevented by all available means from running to waste.

6. The most effectual means of prevent-

ing loss in fertilizing matters, is to cast the manure directly on the field whenever circumstances allow this to be done.

7. On all soils with a moderate proportion of clay no fear need be entertained of valuable fertilizing substances becoming wasted if the manure cannot be plowed in at once. Fresh and even well-rotted dung contains very little free ammonia; and since active fermentation, and with it the further evolution of free ammonia, is stopped by spreading out the manure on the field, valuable volatile manuring matters cannot escape into the air by adopting this plan.

As soils with a moderate proportion of clay possess in a remarkable degree the power of absorbing and retaining manuring matters, none of the saline and soluble organic constituents are wasted even by a heavy fall of rain.

I am much inclined to recommend as a general rule: cart the manure on the field, spread it at once, and wait a favorable opportunity to plow it in. In the case of clay soils, I have no hesitation in saying that the manure may be spread even six months before it is plowed in, without losing any appreciable quantity of manuring matters.

8. Well rotted dung contains likewise little free ammonia, but a very much larger proportion of soluble organic and saline mineral matters than fresh manure.

9. Rotten dung is richer in nitrogen than fresh.

10. Weight for weight, rotten dung is more valuable than fresh.

11. In the fermentation of dung a very considerable proportion of the organic matters in fresh manure, is dissipated into the air in the form of carbonic acid and other gases.

12. Properly regulated, however, the fermentation of dung is not attended with any great loss of nitrogen, nor of saline mineral matters.

13. During the fermentation of dung, ulmic, humic, and other organic acids are formed, as well as gypsum, which fix the ammonia generated in the decomposition of the nitrogenized constituents of dung.

14. During the fermentation of dung the phosphate of lime which it contains is rendered more soluble than in fresh manure.

15. In the interior and heated portions of manure heaps ammonia is given off; but, on passing into the external and cold layers of dung-heaps the free ammonia is retained in the heap.

16. Ammonia is not given off from the surface of well compressed dung-heaps, but on turning manure heaps, it is wasted in appreciable quantities. Dung-heaps for this reason should not be turned more frequently than absolutely necessary.

17. No advantage appears to result from carrying on the fermentation of dung too far, but every disadvantage.

18. Farm-yard manure becomes deteriorated in value, when kept in heaps exposed to the weather; the more the longer it is kept.

19. The loss in manuring matters, which is incurred in keeping manure-heaps exposed to the weather, is not so much due to the volatilization of ammonia, as to the removal of ammoniacal salts, soluble nitrogenized organic matters, and valuable mineral matters, by the rain which falls in the period during which the manure is kept.

20. If rain is excluded from dung-heaps, or little rain falls at a time, the loss in ammonia is trifling, and no saline matters, of course, are removed; but, if much rain falls, especially if it descends in heavy showers upon the dung-heap, a serious loss in ammonia, soluble organic matters, phosphate of lime, and salts of potash is incurred, and the manure becomes rapidly deteriorated in value, whilst at the same time it is diminished in weight.

21. Well rotted dung is more readily affected by the deteriorating influence of rain than fresh manure.

William Gilham.

V. M. I., February 6th, 1859.

For the Southern Planter.

A Hint to Farmers.

Mr. Editor—I hope your expectations have been realized in relation to the success and spread of the Planter. It is at all times to me an acceptable and interesting paper, but whenever I get through with a number, I can but regret that out of the number of intelligent and really practical farmers we have in the good old State, that so few will take pen in hand and commit to paper their experience in growing various crops—their success in the use of fertilizers—such as guano, phosphates, salt, plaster, lime. Those who have used, or wish to use, lime on the clay lands of the Valley would, I know, from my own wishes, be delighted to hear from those that are ahead of them. How much satisfaction would be given if every farmer in Virginia, who has subsoiled his lands would state how many years he had used a subsoil plow, and whose patent he used—how deep he averaged with a surface and subsoil plow, and also whether or not he had found *wheat* and *clover* to withstand the frost of winter better where the land had been subsoiled a year or two previous.

I think it would be well for the State Society to offer a $50 or $100 premium for the greatest number of acres plowed and subsoiled to an average depth of 15 or 18 inches in one season for a corn crop. Also $25 if it can be satisfactorily shown that 10 or 20 barrels more corn can be raised on 10 acres of land plowed and subsoiled, plowed 15 or 18 inches deep—than similarly cultivated without being subsoiled. Such offers would stimulate farmers, cause them to reflect, to read, and to experiment for their own satisfaction for a succession of seasons.

A word about Reaping Machines and Family Sewing Machines. There are nearly 100 different kinds of reaping and mowing machines offered for sale in the United States, and half that number of family sewing machines, and each one proves by legal authority that it is better than all the rest.

In 1843 I purchased a McCormick Reaper at $100. Since then I have become familiar with many different patents, and with the experience I have had, I prefer W. A. Woods' make of Manny's Reaper and Mower, because I have found it simple and durable, and better adapted to the wants of the farmer than any of the others. I have frequently within the past three years examined the different sewing machines in the Patent Office—also those in use in Washington. I have also consulted some of the knowing ones in the patent agency business: the result was, I became satisfied that Wheeler & Wilson, No. 343 Broadway, New York, made the most reliable family sewing machine, because its work will not rip, has fewer changes than any other, and operates with little or no friction, consequently has proven more durable than others that give satisfaction in most respects. I purchased one, and am perfectly satisfied. If every farmer who purchases such things would communicate his success through the Planter, how much vexation and money would be saved to the State. Yours, very respectfully,

Isaac Irvine Hite.

February 8th, 1859.

For the Southern Planter.

Tobacco—the Life and Soul of Virginia Husbandry—*as is demonstrated by the present rapid improvement of the lands in the Tobacco-growing regions of the State, and the prosperous condition of the planters themselves.*

I was surprised to see, in a late No. of the "*Southern Planter*," an attack upon this venerable weed, in honor of which I presume, Mr. Editor, the name of your paper was given. It is true, we often see in Northern Agricultural journals, and occasionally in essays of those across the waters, the gullied hill-sides, and the barren fields of our once fertile State, paraded as the legitimate results of the Tobacco culture; but we as often see the same allusions made to prove the baneful influence of slave labor. I suppose that these barren fields were once rich—but when? I am now muster-free, but my earliest recollections reach not back to that period. Even now, in many sections of our State, we are still mowing the original forest, and but little of it, comparatively, can be called really fertile; I mean, of the lands in the proper Tobacco region. But, sir, if we wish to raise an exuberant crop of anything, wheat, corn, oats, or grass; nay, if we wish to prepare a piece of land for an orchard or a garden, what is the best of preparatory courses? I will venture to affirm, that no man who ever tried it will deny that the *proper* culture of Tobacco on the land is that course. Remember that the *proper culture* implies, and therefore necessarily embraces, *proper manuring.* It stands the high-pressure system of manuring better than any other crop, and upon that system pays better. Bad husbandry in general, indeed a total want of husbandry, has been the bane of *Old* Virginia, and there is vast room for improvement in that respect still. But wherever the spirit of improvement is infusing itself now, the value of the Tobacco crop, as an aid to this great and good work, is beginning to be duly appreciated. A barren old field (if of at all favorable texture of soil) may be taken up and prepared for Tobacco by spreading a coat of leaves and plowing them in, in the Fall, and by an addition of 300lbs. of guano to the acre, and 150 of plaster in the Spring, and a further dressing of 100lbs. of guano and 50 of plaster in the course of cultivation. Here is an average cost of $16 00 to the acre in foreign manures. Two acres and a half to the hand, or 10,000 hills, is a moderate crop when the wheat does not exceed five acres to the hand. So the cost of manures would be $40 00 for Tobacco, to each hand, if we rely on guano. Now for the product. With such manuring and ordinary seasons, we may fairly calculate on each five plants yielding a pound nett, or 2,000lbs. of Tobacco from the 10,000 hills. This, at the present rates for such a crop, would yield $240 00, a sum that would pay for the hire of the hand $150 00, his board and clothing $50 00, and the improvement of 2½ acres of barren land $40 00. You ask, is this all that Tobacco culture can do? Just to clear expenses? I reply by asking: Where is the corn, and the wheat, and the oats, and the numerous other things cultivated by the farm hand—all together occupying more than twice the amount of time employed in raising and fitting for market these 2,000lbs. of Tobacco? Deducting from the whole of this only the cost of cooperage, transportation and sales, and also the feeding of a horse and rent of the land, all the balance is nett proceeds of the slave's labor.

I will ask your attention to the other crops. We will suppose that the wheat, oat, and corn land on the farm is no better than that taken up for Tobacco—a gloomy prospect for a man that seeks to make his bread, more especially if he delights in a sleek horse or a fat hog, or milk and butter. One hand in such land, with 2½ acres of Tobacco, may cultivate 5 of corn, 5 of wheat, and 5 of oats. One horse, 2 head of cattle, 4 of sheep, and 4 of swine, would be ample stock to the hand—much more than enough if the owner and family, white and black, are not living on the land. Without consuming more labor than it is worth, this head of stock could barely give 5 acres of land a light dressing of manure. Let that be applied to the corn, and it might secure 4 barrels to the acre, or $80 00 worth of corn. Now we will allow for the wheat the same expenditure that was given per acre for the Tobacco, and I presume it will be admitted that the average of 20 bushels yield to the acre is a liberal allowance—which pays only 100 bushels on the 5 acres, or $140 00 gross. If I mistake not, the cost of transportation of an equal value of wheat is about double that of Tobacco—not to mention the extra hires in the harvest-field and the cost of machining. It is hardly necessary to make any estimate of the oat crop, for it is confessedly less remunerating than any crop we cultivate. I neglected to deduct the cost of manures purchased for the wheat, $16 00 per acre, or $80 00 on the 5 acres, which at one dash takes off more than half the gross yield, and leaves us only $60 00 from 5 acres in wheat, against $200 00 from 2½ acres in Tobacco. I allow 20 bushels to the acre of wheat on the same land on which I allow only 800lbs. of Tobacco to the acre. I allow $1 40 a bushel for the wheat, and $12 00 a hundred weight for Tobacco.

Now, in what condition do the two crops leave the land? After wheat, it is generally conceded that no cultivated crop succeeds well; but clover and other grasses may follow, and doubtless, in this case, would with great luxuriance, and we might regard the land as improved. How stands the case with the Tobacco land? It is ready for anything. Without a particle of manure, it will yield 15 bushels of wheat to the acre, followed by a luxuriant crop of clover. Or if the process of the previous year be repeated, it will yield 2,500lbs. instead of 2,000lbs. of Tobacco. It will yield from 20 to 25 or 30 bushels of corn to the acre. In a word, it is left in the finest heart and tilth, to be used in any way that suits the planter.

One word as to the rationale of all this. Tobacco is the broadest of broad-leaved pod plants, and therefore feeds more from the atmosphere than any plant we cultivate. It draws from the soil less of the phosphates even when it is allowed to seed. See Liebig's Analysis. We take from the land nothing but the leaf; the stalk and the root are both kept on the land, and not more than one plant in five thousand is ever allowed to go to seed. It is an exhauster of potash, but of nothing else. Long hence may the time be when Old Virginia shall cease to grow Tobacco. If the views presented be correct, and I think they are, how else can we afford to improve our exhausted lands but by the culture of Tobacco, which not only leaves the land in the best condition of any cultivated, but at the same time yields incomparatively the largest revenue for purchasing the manures necessary for extending our improvement. Some speaks of the valuable timber wasted in burning plant patches and firing the Tobacco. Why, sir, Spring before last, which was a most difficult season, I raised an excellent patch on *pine old field*, burnt with *old field pine;* and this present year I have fired exclusively with coal made of old field pine, except one day's drying in one barn. The time occupied in managing the crop is spoken of. Very good, the results show that all of it is time very well and profitably occupied.

NICOT.

For the Southern Planter.

When is the Proper Time for Preparing Tobacco Land?

Mr. Editor—Having but little knowledge of the cultivation of the Tobacco crop, some experienced farmer will do me a favor by informing me, through the columns of the Planter, what is the most proper time for preparing land that is in clover for Tobacco, in order the more effectually to guard against the cut-worm. An opinion is prevalent among some old Tobacco makers in this vicinity, that it amounts almost to an impossibility to make a full crop upon land that has been well set in clover. Some have advised me to plow my land in August, some in October, and so on. They say that the cut-worm is killed by exposure to a winter's frosts. It seems to me, however, that by plowing up young clover late in the Spring, it would furnish food for the worm, and that it would let the Tobacco alone. Yours, &c.,

C.

For the Southern Planter.

Information Wanted, on the Cultivation of Apple Trees.

FEBRUARY 3rd., 1858.

Mr. Editor—As I am a regular subscriber to "The Southern Planter," (though not entitled to the premium you offered in your last to delinquent subscribers,) I make it a rule always to look over its pages when it comes, and am gratified when any subject is treated of in a way within the range of my comprehension.

Being particularly interested at this time in an apple orchard, I turned, with much hope, to the piece, "Profitable Treatment of an Apple Orchard," from Mr. A. A. Campbell; but I find it does not meet my necessities at all. In the multitude of the other products discussed, the apple trees are lost sight of! Will Mr. Campbell be so kind as to say what was the yield of apples, as well as of corn, peas, turnips, and wheat? And how he protected his trees from the depredations of his cattle, when he used his orchard as "grazing ground"? This last information I desire more for the benefit of some of my friends, who do not believe in fences as I do, and whose fruit trees suffer from cattle. I have lately been at the expense and trouble of putting a good enclosure around my orchard, which I have entire confidence in. I have been advised never to put corn or any grain crop in an orchard; but to cultivate exclusively in it peas, sweet potatoes, and such other things as come under the term "trucks"

BY US HANOVERIANS.

For the Southern Planter.

The Cultivation of Pears Recommended.

KING AND QUEEN C. H.,
Jan. 17th, 1859.

Dear Sir—You will receive herewith a few Winter Nelis pears. They are not as good as usual, being a little astringent—owing, perhaps, to being gathered rather early. Let me advise you to plant some pear trees, if you have not done it already. The Seckle, Bartlett, White Doyenne, or Virgalieu, and Sheldon, for Summer; and Winter Nelis and Lawrence, for Winter, have succeeded very well with me. About eight years ago I purchased some pear trees on Quince and some Standard. Those on Quince have borne but few pears. The Standards have borne very full for the last three years. Yours truly,

R. P. JR.

We return our thanks to our friend P. for the delicious pears, which reached us safely.

We give his letter an insertion in the Planter, that it may reach the eye of those who are about setting out orchards. We hope they will all follow the good example he has set, and send us a box of fruit as good as his. Such presents are always acceptable and welcome.

Cuban Tobacco Seed.

We are indebted to our friend, D. H. London, Esq., for a paper of the above seed, which we have distributed agreeably to his suggestion.

We beg his acceptance of our thanks for the seed, and his forgiveness for the liberty we have taken in publishing his interesting letter, which was not written for that purpose.—[Editor.

Havana, Jan'y 4th, 1858.

My Dear Sir—I put under cover some tobacco seed, from the very best quality of the Vuelta de Abajo, the district in which the finest kinds are raised—a range of mountains, on the Southern exposure of which this district lies, runs Westward from Havana to the termination of the Island, and faces the Caribean sea from these mountains, called the Sierra de los Organos. There are, going into the sea, many small rivers, and from this diversified soil is grown the various qualities of the tobacco used in making cigars. The receipt, made out in both Spanish and English, for raising the plant, varies but little from our own method, except in priming, which the Cubans dispense with. My impressions are, that it may be raised in Virginia and North Carolina to advantage by a little care. I am certain that Mr. Carter, who owns and works the place formerly worked by Mr. Curtis Carter, could raise the plant to perfection, judging from some I saw at his place year before last. A very few seed will be enough for several to try them; and I put under cover enough for you to hand to several in the county of Henrico. No time should be lost, as this is the season for burning the beds, or soon will be.

With my regards and good wishes,
I am, your friend and ob't serv't,
Dl. H. London.

Mode of Sowing Tobacco Seed.—It is sown in a plant-bed consisting of vegetable soil—or such soil as you find in newly cleared land,—which soil is passed through a sieve in order to bring it to a proper degree of fineness. (In other words, the soil is to be thoroughly pulverized.) The transplanting is done, placing the plants half a vara (17 to 18 inches, English,) apart. Afterwards, when they have reached the height of half a vara, (about 17 inches, English,) you pinch off the top of the central spire, and this operation is repeated every 15 days, in order that the strength of the plant may be expended upon the leaves below—(literally, in order that the leaves may become well tufted.)

For the Southern Planter.

Applying Guano to Corn and Tobacco.

Near Mount Airy, N. C.,
Jan. 24th, 1859.

Mr. Editor—Will you, or some of your correspondents, through the columns of the "Planter," favor me with some information in regard to the cheapest and most effectual way of applying guano to corn and tobacco? I say "cheapest and most effectual," because here we have to pay from $90 to to $100 per ton, and experience has demonstrated that at that price it will not prove remunerative sown broad-cast. Would *rolling* corn in guano give it an earlier start and preserve it from the ravages of vermin?

I am, respectfully yours,
James C. Norman.

Remarks.—We have been assured by two gentlemen, who tried the experiment of rolling corn in guano *before planting*, that as soon as the grain began to germinate, the sprout was killed, and the field had to be replanted. We *have seen* tobacco made by applying a small quantity of guano in the hill; but we have never used guano on tobacco. We shall be glad to hear from any of our subscribers in response to the queries of Mr. N.

We have, in our own immediate neighborhood, so inexhaustible a supply of chinch bugs, that we are afraid to apply guano to corn—having already suffered severely from their ravages. We made very little corn, and had to pay for guano applied to it, in the Summer of 1856. We believe that guano is much improved, as a fertilizer for corn, by mixing an equal bulk of plaster with it. The only way we have ever used it, was to sow at the time of "throwing dirt" to it, along the sides of the stalks, and then lapping the furrows over it.—[Editor.

For the Southern Planter.

Culture of Sweet Potatoes.

Henrico, Feb'y 15th, 1859.

Ed. Southern Planter:

Dear Sir—I have delayed much longer than I intended, to fulfil the promise made some weeks ago.

I know a farmer who was successful in raising fine sweet potatoes, on the same piece of ground till his death, by liberally manuring and *deep* plowing; and remember well having seen some potatoes raised by him, a year or two before his death, which were the largest I ever saw.

Light sandy, loamy lands, rich, or well filled with vegetable matter, are best adapted to the growth of this favorite esculent. Deep plowing, and perfect pulverization, are essential to success.

Cover the ground with leaves or tags; scatter lime broad-cast, (30 bushels to the acre,) and turn them in. This must be done in February or March. A week before setting out plants the ground should be dragged, repeatedly, till it is pulverized; lay off rows three feet apart, the distance giving ample room to work the potatoes; strew mould in the trenches, which should be deep enough for depositing that fertilizer; cover the mould with earth,—the hills should be from 1 to 1½ feet high. I have no doubt that Mr. G. G. M. will bring his lands to the potato-bearing state again by adopting the method above mentioned.

As to preserving sweet potatoes: Col. Davis' mode is an excellent one, though not cheap. Mine is cheap and simple. It is fixed as follows: Make a pit in the ground, 3 feet below the surface, 12 feet long and 7 wide: place refuse planks on the bottom and walls; then build a structure over the pit, something like an ice house; cover it with straw and earth, expressly to prevent the admission of cold air. A fire should be made in the pit, previous to placing the planks on the bottom, till everything therein is thoroughly dry. Now spread dry tags on the floor; pour in potatoes, which should be dried in the sun a day or two before, and cover them with *dry* tags. An opening may be made in the Southern side, large enough to afford access to the potatoes. *Never open this except in good weather.* Such is our mode of wintering roots.

Respectfully,

X. Y. Z.

Osage Orange.

We have received from our friend, Yardley Taylor, several articles on the Osage Orange, published in the Washingtonian. He will please accept our thanks for them, along with the assurance that, we are *always* glad to hear from him.

We have lately had some inquiries made about the Osage Orange. We would call attention to the advertisement of Gen. Richardson (in our advertising sheet). He is the only gentleman in our vicinity who has had them for years, (so far as we know) and is competent from experience with the plant, to furnish thorough and reliable information as to their culture, &c.

Osage Orange Hedging.---No. 1

WILLIAM B. LYNCH:

With thy permission I propose occupying a space in the columns of the Washingtonian, in reviewing a book on hedging by Dr. John A. Warder, of Cincinnati, and published by A. O. Moore, Agricultural book publisher, 140 Fulton Street, New York. The book contains 291 pages, with 219 pages of it devoted to hedging, and the remainder of it to evergreens, their propagation, transplanting and culture in the United States. The work is eminently practical, Dr. Warder having been engaged in hedging his farm at North Bend, Ohio, for a number of years, without having anything to do in the sale of plants. He has called to his aid the practice and experience of other persons largely engaged in the use of hedges, and thus presented a large amount of practical experience in making a good and durable enclosure for farm purposes.

The different varieties of plants used for hedging, are treated of, and their adaptability to our soil and climate considered, and the conclusion is generally admitted, that the Osage Orange is *the hedge plant* for this country. It being a native and hardy growth South of Lake Erie, with its strong and sharp thorns, and leaves that no stock will eat, its tendency to branch abundantly when cut down, gives it advantages that no other known plant so eminently possesses. The botanical name of the plant is Maclura aurentiaca, called Bois d'Acre French, now Bodark, and Bow Wood by the Indians. It takes its name of Osage Orange from the form of its fruit, being the size of a large Orange, but rough on the surface, and filled with a tough, bitter, stringy mass filled with seeds, radiating from the center, and larger than apple seeds. The business of hedging in the west, is now so systematically conducted, that persons go to Arkansas and Texas and collect thousands of bushels of seeds annually for use and sale. The lessening of the timber lands of Ohio, and the very extensive prairie farther west calls for a large amount for hedge purposes, and since it has been proven practically that it may be made to answer a good purpose, it seems likely that the demand will continue for a long time to come.

The failure of hedges is treated of at length, and the reasons given, the laws of vegetable physiology are stated, and a system based upon those laws is advocated and shown by experience to be correct. This system *must be* adhered to, if we wish to be successful, and as success has always attended where these principles have been adhered to, they are insisted upon with confidence.

The whole operation, from the procurement of the seed, to the full grown hedge is treated of and explained, so that any person with ordinary judgment may succeed by following the directions given. The best way for us, in this section to procure seed, is to send to some reliable dealer in the article and obtain them. We have been in the practice of sending to Cincinnati, to J. F. Dair & Co., 40 and 42 Market Street, agricultural seed dealers, and have obtained good seed; cost, there, about $4 per peck, and then $1 per express to Harper's Ferry. One peck last spring, produced us this fall, upwards of 16,000 plants. Persons designing to go largely into planting, might prefer to raise their own; but generally, for small quantities, would be better to give $3 per thousand than to plant themselves. After the seed is procured, it must be prepared for sprouting, as it has a hard shell on, by pouring boiling water upon it, which should be drained off, and the seed is then to be kept covered snugly, until it is ready to sprout, this will require about a week, more or less, according to the temperature. If the seed is in a large mass, it should be frequently stirred to prevent fermentation. In the mean time prepare the ground by deep ploughing and harrowing; the soil should be good, and if somewhat sandy so much the better, it will not bake so hard as clay soil, which is of importance with plants of so large seed leaves as this. When the ground is made mellow about the 1st to 15th of 5th month, (May,) according to the season and the sprouting of the seed, proceed to plant, remember the ground must be warm to ensure good success. Stretch a line across the plots and make shallow furrows as if to plant peas or beans, then drop the seed in these rows about an inch apart, and cover with the earth drawn over them in a ridge, cover them two or three inches deep, according to the weather, shallower if threatened with rain, but deep if dry weather is probable. The rows are recommended to be eighteen or twenty-four inches apart, so as to use the horse tillage during summer; but we use a seed drill, and hand garden plow, which we prefer. By having a ridge over the seed, and going along with a small rake and drawing the top of it down, just before the plants make their appearance above ground, we destroy the first crop of weeds in removing the crust and greatly facilitate their appearance particularly if the soil is of a clayey texture. Summer cultivation will consist in keeping the ground stirred and free from weeds; for this purpose drill planting is much preferable. The plants, if too thick, may be thinned out, and good cultivation is very desirable, as yearling plants are much preferable for planting. The plants may stand in the ground until spring without injury; but it is recommended to take them up after frost, and bury them in a dry cellar after cutting their tops off, or they may be buried in the ground like potatoes. The advantage of this is, there may be rainy weather when we want to plant in the spring and prevent us doing so at the proper time, while the plants in the ground will start to grow and may be injured by so doing, while if we have plants cut we can prevent this without any injury to the plant. Other recommendations are made not necessary to recapitulate here, as I presume any persons wishing to go into the hedging business would procure the book at once, which may be done by enclosing one dollar to the publisher and the book will be returned postage paid by mail.

To plant the hedge, first prepare the ground thoroughly by deep ploughing and subsoiling, and have the bed at least six feet wide. This should be done sometime before planting, and at the proper time for planting, have the surface well pulverized, and all clods, stones, &c., thrown off the middle, where the planting is to be done. Stretch a line where the plants are to be set, and be sure to have them straight. Sme prefer planting with a dibble, others with a trowel; but Dr. Warder prefers the spade, thus by inserting the spade down by the line, a foot deep, at an angle of forty-five degrees and slightly raising it, the plant may be thrust down under it, and held till the spade is withdrawn, and then tread down with the foot. The plants should be set about two inches deeper than they stood in the seed-bed. Spring planting is on the whole preferred. The distance of the plants apart in the row is important, and in this there is a difference of opinion among hedge-growers. Some recommending planting in two rows 6 inches apart, with one foot apart in the row so as to equal 6 inches apart in the two rows; others seven and one-fifth inches apart in one row, or five to a yard; others eight to ten inches apart in one row. After giving those opinions of writers, some of whom rank very high as experienced hedgers, Dr. Warder goes on to say, "Yet I cannot coincide with them, while my observation of facts and my reasoning or deductions therefrom teach me to anticipate serious evils from crowding, as intimated on a previous page." He recommends twelve, eighteen or twenty-four inches as near enough in the row, and thinks that with proper cutting down and encouraging lateral branches, it will make a more healthy and better hedge, than if crowded so close. Five inches apart will take thirty-three to a rod, seven inches twenty-eight, eight inches twenty-four and a half, ten inches will take twenty plants, while one foot would take sixteen and a half, one and a half apart would take eleven, and two feet apart eight plants to a rod; thus the different distances would require considerable difference in the first cost of the plants I presume that the difference in the soil would require a different distance apart, for on a strong soil that would induce a strong growth, by proper trimming the lateral branches would readily fill a larger space than they would in a poorer soil, and this may possibly account for some difference of opinion. Dr. Warder's soil at North Bend, is a strong soil. In my next I propose treating of the manner of trimming hedges.

YARDLEY TAYLOR.

(No. 2.)

In the first number the manner of proceeding for a hedge as far as planting the sets was treated of. The most important part, however, is its future treatment by trimming; on this the whole success depends, if we wish a perfect hedge, and one that will last a long time, and no other should be attempted. On this point no difference of opinion exists among practical hedge growers; they all advocate, and that in strong terms, close and frequent trimmings for four years. The first year, however, they prefer letting the plants grow, to give a strength of roots before commencing close cutting, and this year the ground should be well cultivated, and no grass or weeds suffered to grow to the injury of the young plants. Then the second year before the buds swell, cut the plants clean off at the surface of the ground, this will cause several shoots to put forth from the plant; the object being to get a thick base for the hedge at first start. Should the soil be good, the season favorable and the growth strong, cut down again about midsummer to within two or three inches of the first cut; but if the growth is moderate, the cutting may be deferred till spring. It must then, however, be cut both spring and summer still three or four inches above the last cutting, for the next two years. These cuttings should be horizontal and only made upon the upright shoots, the side, or lateral ones, must be preserved by all means. The philosophy of this mode of cutting is this: all plants have a tendency to grow upright and expend the greater part of their strength in the higher branches; but in a hedge we want the lower branches strong and numerous, and to obtain this, we must retard this upward tendency, and force the growth into the side branches. By cutting the strong and vigorous growing shoots back frequently, we spread the face of the plants over a much larger space, and as a consequence, there is much less disposition to rampant upright growth, and the growth will be much more regularly spread over the whole of the plant. The ground on each side of the hedge should be well cultivated, and nothing suffered to interfere with the growth of the lateral shoots. In three years we then have a base one foot high and probably three feet broad. Now we may commence to trim in a triangular form, say five or six inches high in the centre each time, and straight down to a base of three feet wide, and the subsequent trimmings to be in this way until the hedge is five feet high and three or four feet broad at the ground. It will thus be a good hedge, and a sufficient protection for any enclosure, and then all subsequent trimmings must be as close to former trimmings as possible, so as to keep it at the proper height, and not to allow the upper branches to overgrow the lower ones, lest they be starved out and finally die off, to the great injury of the lower part of the hedge. This must be particularly attended to, if we want to succeed. The side should never, by any means, be allowed to assume a perpendicular form; but should be kept to that of a triangle, or it may assume something of the form of a gothic arch. In these directions, there is no difference of opinion among hedge growers in the West, they all, without exception, insist upon close and severe pruning on the above principles; they argue, and with reason, that it is useless to attempt to make a hedge without strictly following these rules, and the success that has attended where they have been followed, is good evidence of their correctness.

James McGrew, of Dayton, Ohio, who prepared a prize essay on hedging for the Ohio State Board of Agriculture, says in relation to the business: "It is not to be supposed that an individual without any practical knowledge could successfully cultivate and properly form a hedge. It is really no small matter. It is a work that is to last for generations. Those who attempt to grow a hedge should spare neither care no expense in having it right. If well done, it is an invaluable improvement upon any farm—if not well done, it is an entire waste of time, room and money. The business can only be learned as other things are learned, by careful study and practical experience. It is not a matter to be intrusted to novices, tenants and gardners."

Dr. J. A. Kennicott, of Illinois, says:—"One fact is certain, thick or thin planting, there will never be reliable fence without severe cutting."

The editor of the Illinois Farmer says: "I would strongly recommend, however, that it be cut back far more severely than usual, in order to give it a thick bottom, for on this its main excellence depends."

The book under review gives the reasons of the general failure of hedging in this country—one is the unsuitableness of some plants for the purpose; but the greatest cause of failure has been, want of proper management, in not cutting the plants down sufficiently to insure a thick growth at bottom, and thus encouraging bottom growth, for if let alone to grow as it pleases, the upper branches will spread and enlarge, and thus rob the lower ones of their share of nourishment, in accordance with the known laws of vegetable physiology. These lower branches thus robbed, put on a feeble growth and finally die, leaving the plant in form of an inverted cone, a form directly the opposite of what it should be. Attempts have been made to remedy this by splashing or bending down, but with indifferent success. But by using the Osage Orange, and cutting back faithfully as recommended, the assertion is fearlessly made, that a good, efficient and very durable hedge may be made, and one that will be an ornament, and of service, no one can say how long.

This plant has the valuable property of standing drought remarkably. We planted a few rods of it in the spring of 1856, and though they grew but little that dry summer, there was very few of the plants that died, and they grew off well next year, though they were on a dry piece of soil of poor quality.

The expense of making a hedge, is estimated by those who have them in the West and made in the best manner, at from fifty to seventy-five cents per rod, when the labor has been estimated as hired, being mostly done by their own hands. There are persons who profess to be practical hedge growers, and will contract to plant and trim and do all the cultivation for four years, or until the hedge is sufficient to turn out for a fence, and give warrantee for its being done well. I see no difficulty in the way of making a hedge here, if undertaken earnestly, and with a determination to follow the rules laid down in Dr. Warder's book. Of course every person who desires to do so should purchase the book and study its contents thoroughly, and then carry them out to the letter. These rules are certainly in accordance with the laws of vegetable growth, and as far as my experience goes, and I have had some experience in hedging on the old plan with the Washington thorn, they are certainly well calculated to ensure success, and such a success would be very desirable, as fencing materials with many are becoming scarce.

YARDLEY TAYLOR.

(No. 3.)

The inquiry that naturally will present itself to the mind of every farmer is, will it be of advantage to me to commence making Osage Orange hedge Those who have stone for fencing, will hardly deem it advisable, and those who have mountain land for timber, may not consider it economy to commence to much extent. But those whose land now in timber is tillable land, may well conclude that good economy would advise the clearing more of it, and bringing it under cultivation. In this way large additions may be made to our agricultural products, and of course to our profits. From the confidence asserted by the hedge growers of the West, in the plan recommended by them, and looking at the philosophy of the proscribed mode, there is strong ground for believing that it will succeed here, though in many places it may take rather longer time to make a sufficient hedge. Our own experience satisfies us, that it will grow here in almost any soil not too wet. Some may object on account of the protection needed when young; but the prudent farmer may so arrange his crops, that he may have his young hedge in fields under cultivation where stock is not allowed. For instance: suppose a hedge was planted between two fields, one of which was to put in corn the same spring, then move the fence on to the other side and leave it in that field, then put the corn land in wheat that fall, or leave it for corn the second year, in either case put it in wheat for the third year, then move the fence over the hedge on to the other side, and commence a like cultivation of the apposite field, that would give it a protection of four or five years, sufficient to give it a height and strength that would make it secure from stock, and that, too, without any additional fencing or expense, except moving the fence over the hedge, which would be a small matter. After the hedge is considered complete, it will require regular attention to keep it in proper bounds and not allow it to grow too high; this, however, will be much less labor, than that now employed to keep our fences in repair. Where the hedge has been properly attended to, and the growth diffused over a large space, there is much less liability of any shoots making a rampant growth, and are easier kept in bounds. A man with a suitable instrument, it is asserted, can trim from half a mile to a mile of such hedge a day. And this being all the labor necessary to keep them in condition, is certainly a great saving of labor over present practice, to say nothing of the capital necessary in keeping up timbered lands. There could be nothing introduced on a farm, that would add more beauty to it, than to have all the divisions of it bounded by good hedges. And the certainty with which we may expect to obtain coal for fuel, and its cheapness, will prevent the necessity of keeping much land in timber for that purpose.

YARDLEY TAYLOR.

Body and Brain.

When a Mohammedan wishes to pass a very high eulogy upon a deceased friend, he tells you that he "had a good liver," which means that the said friend was always good and pleasant in body and mind. This is a most expressive sentence, especially in climates where the liver is easily affected, and it shows that the sons of Islam are well acquainted with the fact which we wish to enforce, namely, that the healthy action and clear conception of the brain depends more than is generally believed upon a sound and healthy physical organization.

No argument is required to convince every person that, at the present time, they must *think*, would they succeed in life, and that mere plodding is scarcely required, the demand being for educated labor; and this remark applies not only to one trade, but all trades—not to one profession, but all professions—artist and artificer, printer and preacher, all alike. This being granted, it will be seen of what vast national and individual importance it is that the seat of reason should be undefiled, and that the channels of thought should be ever clear and free. A professional humbug who would advertise a quack medicine to overcome that brain fatigue which sleep does not seem to conquer, and to give renewed activity to the worn-out mind, would make a fortune shortly, for the complaint is a common one. Bodily disease, the disregard of the grand physical laws of cleanliness and exercise, inherited sickness and personal intemperance, are the great barriers to true progress which have yet to be vanquished and pulled down.

Let us take the two first, and see how they affect the mainspring of action—the brain. Take the illustration of a watch. The mainspring may be perfectly good and sound, but some little wheel in the train of motion being displaced, it will not tell true time. A spring may be clear when it bubbles forth from the virgin soil, but an impurity in the water course will taint the whole stream. A statue may be graceful in form and elegant in proportion, but when seen in an uneven mirror it becomes distorted and out of shape. The mind may be active, clear, and perceptive; but if some little pinion, some small disease, local or general, be in the body, it cannot act upon the outer world with force and originality, because the medium through which it acts is tainted and unhealthy. Again, if the ear be out of order, the brain can obtain no true notion of sound; if the eye be diseased, a perfect sight is never taken, and the same is true of feeling, smelling and tasting. Now, suppose that instead of any one sense being considerably affected, all are partially so, how then is the brain going to derive impressions correctly, on which to base future thoughts and resulting actions, if the courses through which those impressions flow from the object observed to it are tainted, impure or diseased. Thus we see that the mind and body are so intimately connected that we cannot separate the two, and the one cannot be diseased without affecting considerably the tone of the other. For a mind diseased, or one that may become so—in fact, for every one of us—there is nothing like plenty of fresh air and simple food, a decent modicum of exercise, the encouragement of cleanliness by ablution with cold water, as much of the light of heaven and as little of the light of oil, spirits or gas as possible. If we can but as a people begin to believe this, we shall quickly perceive the truth of the prescription by the happy results which will follow. Let us all, for once, learn something from the children of the Prophet, and strive to earn that eulogy so full of peaceful meaning and pleasant thoughts of contented health: "He had a good liver." *Scientific American.*

Meterology—Interesting Fact.

Without warm breezes and frequent rains, no country is fit for the abode of man. The rains clothe the fields with verdure; their absence makes the land a barren wilderness. On the western portion of our country lying on the Pacific Ocean, a belt of rains accompany the sun in his annual course north and south, and produce the rainy seasons of California and Oregon, without which these countries would be unfit for agriculture. On the eastern side of the mountain ranges of the Pacific, the case is very different; but little rain falls upon the elevations or the valleys, hence there is a wide expanse which never can be inhabited, as it is only a barren waste, and must ever so remain, as all the science and skill of man cannot make the rains, nor change the course of the winds.

Two great ranges of mountains run north and south through our continent, namely, the Rocky Mountains on the west, and the Appalachian chain near the Atlantic on the east. There is a great broad interval between these, which is called the "Mississippi valley." This depression runs north to the Arctic Ocean, and south to the Gulf of Mexico. The western mountains gradually decrease in elevation towards the north, and as there is no northern range, the north and north-west winds have a free sweep down the Mississippi valley; consequently, when these prevail in winter, the cold is very severe on our western prairies; this also affords a reason why it is sometimes colder as far south as St. Louis than it ever is in New York. The Gulf of Mexico is a huge steam cauldron; it evaporates an immense amount of moisture; this is carried up by south winds through the valley of the Mississippi and by south-west winds along the whole eastern coast This moisture as it proceeds onward is condensed, and falls down in grateful showers to refresh the soil, and enable it "to bring forth seed for the sower, and bread for the eater."

As a great amount of electricity is developed by the evaporation of water, the Gulf of Mexico is the principal source of that which is observed during thunder storms; hence the reason why almost all such storms come from the Gulf. The moisture which flows up the great Mississippi valley does not reach far west; seldom beyond the 98th meridian. East of this the soil is fertile, because it is amply refreshed with rains; west of it, up to the Rocky Mountains, denominated the "great American plains," all is a barren wilderness; there is not an object of delight to the eye to be seen. On the Pacific coast, with the exception of a belt along the ocean, barrenness also prevails, owing to the absence of fertilizing showers. Were it not for artificial irrigation, the valley of Salt Lake could not afford sustenance for man or beast. In traversing this great barren track, whole days are passed without meeting with a single spring or rivulet to slake the thirst of the weary traveler. Over the greater portion of Sonora and New Mexico sterility reigns supreme; and at Fort Defiance, a range of fifty square miles is necessary for grazing, and procuring hay for the animals of the garrison.

If the map of the United States is examined, it will be observed that the 98th degree of west longitude divides it into two nearly equal parts. As all the western portion (until the belt on the Pacific is reached) is a barren wilderness, this fact must dissipate some of the waking dreams in which many persons have indulged regarding the future agricultural greatness of the far western portion of our country. The eastern portion of the Mississippi valley, by the laws of nature, must forever remain the granery of the United States. *Scientific American.*

From the New England Farmer.

Golden Eagle.

AQUILA CHRYSAEOTOS.

The most hilly and mountainous parts of the country are chosen by this bird for his residence, particularly where there are overhanging precipices; there in the dizzy height, on some bold rock, he takes his stand, motionless and erect, with his stern, penetrating eye glancing over the boundless expanse of forests and fields; upon such high precipices, or on some blighted tree of the wooded-mountain, a pair of these birds will sit for hours, and not unfrequently the whole day, especially when they have gorged themselves with food. After such times of inactivity, they will launch into the air, and rise in a spiral flight above these stupendous heights, until they appear like mere specks, or are wholly lost to sight; having attained to the desired height, they sail in an obliquely downward course with the velocity of the wind, until within one or two hundred feet of the earth, when they again change their mode of flight and sweep in circles over hills and valleys in search of food.

These eagles usually hunt in pairs. There is a peculiarity in their mode of hunting which is not resorted to by other birds of prey. Like the lion, who lies in ambush for his coming victim, so he hovers over the form of the hare, or the bed of other animals, waiting for their appearance. I once saw a pair hunting in company, and while sailing over a hill, one of them, on discovering a burrow of the common grey rabbit, immediately suspended himself in the air without the least perceivable motion of his body or vibration of his wings, which he kept widely extended, and on which he floated with the same ease that he would rest upon his perch; in this position he remained a great length of time until the animal, unconscious of any harm, ventured from his cover; at first, but a part of him appeared; the eagle, still poised, would stretch down his claws, then draw them up again, still floating silently; the animal now hopped quite out of his hole, stood upon his hind legs, scanning every object with his large eyes, and moving in every direction his large ears, to detect an enemy if one was around him; at last, feeling assured, none lurked about him, he hopped again which brought him to full view, and farther from his burrow. Hark! *Whush-ush-ush*, down from his height, like the whizzing sound of a rocket, shot the eagle upon the unwary victim, pressing him down with his strong feet and driving his talons deep in his quivering flesh. The scream of despair, as the blood oozed through his soft fur, was soon drowned by the eagle's scream of success which was answered by his mate; then rising with him, still struggling in his grasp, he carried him to some convenient place, where both he and his mate might devour him at their leisure.

A. Fowler.

Danvers, Mass., Dec, 1, 1858.

Salutations among Different Nations.

Translated from the French.

The expressions used as salutations among different nations, have under their aspect something characteristic and interesting even for the most casual observer.

In the East, some of the expressions savor, in a greater or less degree, of the Scriptures, and the serene and patriarchial sentiment of the inhabitants. One recognizes the immobility of these pastoral and warlike people, standing aloof from all human progress.—Nearly all have a foundation in religious sentiments, and express peace to those whom they are addressed. The salutation used by the Arab, "Salem," or "Shalum," means peace, and it is found in the words Jerusalem. The Arab salutes his friend thus: "May you have a happy morning;" "May God grant you his favors;" "If God wills it, you are well." This last expression plainly betrays their fanaticism.

The Turks have a formula which can only be used in a sunny clime; "May your shadow never be less." An Englishman wouldn't think of wishing his friend a fine shadow.

The climate of Egypt is feverish, and perspiration is necessary to health, hence the Egyptian meeting you, asks, "How do you perspire?"

"Have you eaten?" "Is your stomach in good order?" asks the Chinaman, a touching solicitude, which can only be appreciated by a nation of gourmands.

"Good cheer," says the modern Greek, in nearly the same language that the ancients were wont to greet their friends. A charming salutation, which could only have originated among the happy, careless Greeks.

The Romans, who were heretofore robust, indefatigable and laborious, had energetic salutations, expressing force and action.—"Salve," "be strong," "be healthy," and "Quid facias," "what do you?" or "what make you?"

The Genoese of modern times say, "Health and wealth," which is very appropriate for an active and commercial people.

The Neapolitan devoutly says, "Grow in sanctity," and the Piedmontese, "I am your servant." The "How stand you?" of almost all Italy, forcibly indicates the nonchalence of the sunny land.

The Spaniard, grave, hauty and indifferent, wishes you "Good morning," to which we respond, "at your service, sir." Another salutation which the Spaniard uses, "God be with you, signor," shows a melange of respect for one's self religious sentiment.

The ordinary salutation of the German is "Wie gehts?" "How goes it?" and has a vagueness partaking somewhat of the dreamy character of the German. To bid one adieu, he says, "Leben sie wohl," "Live quiet and happy." This last plainly exhibits his peaceful nature and love for the simple joys of life.

The travelling Hollander asks, "Hoe waart's go?" "How do you go?" The thoughtful, active Swede demands, "Of what do you think?" whilst the Dane, more placid, uses the German expression, "Live well—Live well." But the greeting of the Pole is best of all: "Are you happy?"

The English have the "Good Bye," a corruption of the word "God be with you," and some others; but that which exhibits best the character of the English is, "How do you do?" as the activity of this people is shown in this demand where the do is spoken twice. Nothing is more characteristic, more likely, or more stirring than this.

The "comment vouz portes vous?" of the French is equally characteristic. The Frenchman is more active than laborious—more ardent, more passionate, than thoughtful; hence the principle with him is not to do, but to go, to be lively, to show himself. There is something in the expression, "comment vouz portes vous?" "How do you carry yourself?" which bespeaks at once his frank manner and pleasant face.

Walking as an Exercise.

It is well understood that the general health of cities is due to the custom of constant walking, which prevails among the residents of crowded towns. This compensates for the want of fresh and free air. It is certain that city ladies walk much more than their country friends. The latter, when they can command a horse, think a mile's walk a great undertaking. Ladies in the country hesitate about venturing abroad on foot; and they remain within doors, or in quiet inaction, while the city dames, who are presumed to be "delicate," and unable to endure fatigue, walk miles over the pavements, without thinking of the exertion. Visitors to the city from the country are worn out by a day's "shopping," while their city guides are apparently as fresh at the close as in the beginning of the day's work.

Walking is the most natural, useful and thorough exercise that can be taken. Infantry, in an army, can outmarch the mounted men. A proof of the superiority of the biped over the quadruped, is given in the result of a recent wager. A man undertook to walk from New York to Cincinnati in eighteen days, and accomplish the task, with nine hours to spare. The person with whom the bet was made accompanied him in a carriage, and the pedestrian, at the end of the journey, was in better condition than the horse or his driver. This accords with all experience. The human frame becomes insured to wholesome and proper exertion, and the biped gains strength under it, in a greater degree than any quadruped. We have no objection to dumb bells and other paraphernalia of the gymnasium. But none of these contrivances are half so beneficial as the use of our natural means of locomotion.

The people of this republic have the largest continent in the world to travel over, and are, as a nation, the greatest travellers. But while the rail, the river and the horse carriage are all used to the utmost, we walk less than any civilized people under the sun. A man, no matter how much his leisure, or how great his need of economy, would be thought very poor, or next to insane, who should use his feet for a journey. He would, at the very least, be set down as eccentric or a humorist. Where time is valuable, or strength is to be husbanded for active employment, it is well to take advantage of public conveyances. But if Americans would prescribe to themselves what John Bull calls his "constitutional walk," we should gain in strength of muscle, and banish or diminish the common complaint, dyspepsia. Athletic games are well in their way, but one cannot always get up a cricket or rowing match. The consent of others is required, whereas, to walk briskly and habitually, it needs only that we overcome our own inertia, and disabuse ourselves of the notion that a horse's legs are better than a man's.

No motion calls more of the muscles into healthy play than walking—not gliding like a ghost, with arms motionless, but pushing along, with a hearty, springy swing. Nothing more exhilarates the whole man than a current of air created by his own brisk movements. If this exercise, so conducive to health, and so readily taken, were more in fashion and in favor, we might meet the doctors with an independent air; and as to the nostrum-mongers, starve them into taking up a more useful avocation.—*Philadelphia Gazette.*

The Ice Trade.

One half, at least, of the business and wealth of the United States, has been created by the ingenuity of the American people. What would the production of cotton be worth, an article now our heaviest export in value, but for the invention of Whitney's cotton gin, and the late improvements on it. The articles of cut nails, of the screw auger, of the spiral gimblet, of the solid headed pin, and fifty other things, the value of which we do not realize because we are so familiar with their use, are all American inventions, and have given a spur to business of inconceivable force.

The Ice export is a trade which has grown up within the last few years, and is a remarkable illustration of the business-creating faculty of the Americans. Ice has now become a staple article of commerce, employing in the coasting trade two hundred and fifty-eight ships, brigs and schooners, and for foreign export ninety-five vessels, principally of a large class. Total 353 vessels.

The following taken from the late *American Almanac* furnishes some interesting statistics on the subject:

"The first cargo over taken from the United States, was shipped from Boston, in 1805, by Frederick Tudor, a gentleman who had previously dispatched an agent to the West Indies for information touching the enterprise. The cargo went to Martinique and proved a loss of $4,500, but the projector of the enterprise stuck to it with a continual loss, until the embargo and war put an end to foreign trade. After the war, in 1815, he recommenced the trade by shipments to Havana under a contract with the government of Cuba, which yielded a profit. In the meantime he opened the trade with Charleston, Savannah and New Orleans.

"Up to 1832, the business was confined to the enterprise of this one individual. At that period others embarked extensively in it, and in 1833, Tudor extended his operations to Calcutta, Medras and Bombay. The shipments of ice from Boston in the year 1847, coastwise, amounted to 51,887 tuns, making 258 cargoes; shipped to foreign ports 22,591, making 95 cargoes. The freight, storage and other expenses on the whole amounted to $335,151. In the same year, 29 cargoes of provisions, fruits and vegetables, valued at $75,500 cost, were shipped in ice from the United States, to ports where such articles could not otherwise be sent.

"Eight of the ice houses in Massachusetts, erected purposely for the trade, are capable of containing 141,332 tuns. The consumption of ice in Boston alone, in 1847, was 27,000 tuns, employing 66 wagons in the delivery. In Havana, ice sells for 6¼ cents per pound, in Calcutta at 2½ cents, in Boston at 13¼ cents per hundred pounds; on the average. The entire statistics of the ice trade, are highly interesting, not only as evidence of the magnitude it has assumed as an item of commerce, but as showing the indefatigable enterprise of the man-yankee. There is scarcely a nook or corner of the civilized world, where ice has not become an essential if not common article of trade. The city of New York consumes an immense quantity, giving employment to a great number of persons, and involving a large amount of capital."—*Scientific American.*

FRIENDSHIP.—A friend is a person with whom I may be sincere. Before him I may think aloud.—*Emerson.*

From the New England Farmer.

Underdraining—"It Will Pay!"

Mr. Editor:—Last fall I wrote you under the title, "Underdraining—will it pay?"—that I intended to underdrain a piece of wet, cold, unproductive land, and asked your advice in the matter. It was kindly given, for which I would return many thanks.

At that time I had a presentiment that it would not be a paying operation, but as the land was nearly worthless, as it was, I resolved to underdrain it; which I did with stone, sinking the ditches about three and one-half feet deep. The bottom of the drains was constructed like an ordinary culvert, then filled with cobble stones to one foot of the surface; upon these stones, shavings or evergreen boughs were placed, to prevent the dirt from filling the interstices, then covered with dirt, reserving the sod for the barn-yard.

The result, I will briefly state. The piece drained contained a little less than four acres. Last year it was mowed, and produced but two loads of poor, sour hay and brakes, hardly worth cutting, but it was an average crop for the land. This spring the land was dry, and we were enabled to work it early in the season. We plowed under about twenty-five ox-cart loads of barn-yard manure to the acre, and planted with corn the 15th day of May. The ground was dry and in good condition for receiving the seed while many pieces considered "dry land" were much too wet. The corn was planted three and a half feet apart each way, hoed twice, and received a top-dressing of plaster and ashes. It was cut up the 10th and 11th of September, when it was found ripe and sound. We husked from the piece 440 bushels of ears, all merchantable corn.

My neighbors concur with me in opinion that this crop is worth more than the aggregate crops that the land has produced for the last fifteen years. It is now in a condition to produce abundantly for a series of years without any extra outlay. This crop has paid me the whole expense of underdraining, and I am so well pleased with the experiment, that I have had a number of ditches dug upon another piece adjoining, and intend to use drain tile instead of stone. The tile drain is cheaper, and from what information I can obtain, I think it much more durable.

Drain tile of a superior quality are now manufactured by Lucius G. Spencer, of this town, and sold at Albany prices. The farms of Windsor county are waking up on the subject. I am informed of one man who intends to lay four hundred rods from the first kiln.

James R. Walker.

Springfield, Vt., Nov. 5, 1858.

From Dickens' Household Words.

Beef, Mutton and Bread.

A council composed of noble and gentle amateurs; a sprinkling of real farmers; a library of books on agriculture which few read; models of implements which few examine; and samples of seeds for which few inquire—these are the components of the Royal Agricultural Society as it exists in the dingy mansion of Hanover Square, London. For eleven months of the year its only sign of life is an occasional discussion, from which reporters for the public press are inflexibly excluded; but, on the twelfth there follows, thanks to railroads, a July fortnight of real agricultural work. Then the whole agricultural element of the district chosen for the annual show is set fermenting by the presence of the most agricultural members of the society, and a general invitation to all England to come forward and compete for prizes with their agricultural implements and live stock. This year the great agricultural holiday was held at Lincoln;—once the nucleus of Roman roads; now in the centre of one of the finest farming districts in the country, and connected by railways with every county between Plymouth and Aberdeen.

Eighty-four years ago, Arthur Young, one of the most far-seeing and graphic writers on English agriculture, made the journey from Peterborough to Lincoln on horseback, occupying twice as many days as a railway train takes hours; following ancient ways; partly of Roman construction, and passing over causeways through seas of fresh water, which now, thanks to the Cornish steam-engines, have been drained into fat pastures, where, on every acre, an ox or cow, bred far north, can be fattened for the London market.

As I approached Lincoln to be present at the fourteen days' show, the evidences of the Past and Present met me on either hand. Of the present, in the shape of solemn but amiable-looking bulls, carefully clothed in slices of Brussels carpet hemmed and edged with tape; heifers, of equally pure blood, and Leicester and South Down sheep, all riding comfortably in railway trucks. A real monument of the Past rose on Dunston Heath:—Dunston Tower, erected in the last century as a light-house to guide travellers across the black moor between Spilsby and Lincoln,—a waste then, but now the centre of farming as fine as any in Europe: at least so I was told by a tall, rosy, wiry, pleasant-faced farmer, in a full suit of shepherd's plaid. And here I must note that the real John Bull farmer, whom artists of a waning school depict in top-boots, seated before a foaming jug of nut-brown ale, and beside the portrait of a prize ox, seems to have been improved out of the country. My closet researches at Lincoln did not discover a single specimen.

There was no mistake about the character of the meeting; it did not require top-boots to indicate that it was not scientific, nor antiquarian, nor literary, nor military, nor commercial; but, that it was simply and solely agricultural. The whole multitude of strangers who crowded the street,—studying the Latin motto of "Floreat Lindum" inscribed in red letters upon white calico, on the arch of evergreens, or holding conversations round the steps of the hotels—had a breezy, out-of-door, healthy, tallyhoish appearance. Black, bay and gray horses, of huge proportions, gaily adorned with ribbons (the unmistakable sires of London dray-horses,) were led carefully along towards the show-ground by the only top-boots extant. Roan Short-horns, red Devons, and white-faced Hereford bulls; cows with interesting calves; and plump heifers, paced along with a deliberation and placidity worthy of their high breeding. It is only young Highland kyloes and Scotch runts that played wild tricks, and scampered, as Leigh Hunt said of certain pigs, down all manner of streets. Anon came a select pen of ewes, or a ram, conducted with a sort of care we can imagine the sultan's guard to bestow on an importation of plump Circassian beauties.

Guided out of sight of the bovine and ovine procession by the shrill squeal of discontented Yorkshire pigs nearly as large as, and much heavier than, Alderney cows; across the bridge over that Witham stream through which Romans, and Danes, and Saxons, and Normans, successively rowed on their way to Peterborough; along a gay and dusty road, where stood those wonderful works of art dear to my childhood's dreams;—Wombwellian wild beasts painted on acres of canvass, in the most exciting situations; at length I reached the show-yard. The parallelogram of some four acres contained an epitome of the materials and tools which make modern British agriculture what it is. There were instruments for cultivating all sorts of soils; and live stock which can be sent to the butcher's in one-fourth the time that our ancestors found indispensable for producing fat meat. In natural course the implements come before the stock which they have helped to bring to perfection.

The first operation for bringing our food into a condition fit for the butcher or the baker is to turn over the soil; for which, the best implement that has yet been invented is a plow. In the Lincoln yard there were not less than thirty-nine sorts of iron plows, for every degree of work, from scratching the turf to turning up the earth twenty inches deep. Those who have seen the rude plow still in use in the South of France and Italy (where the team is often composed of a dwarf milch cow, a donkey, and a wife; the husband holding the one stilt) will be surprised to learn that in seventeen hundred and thirty a plow was made at Rotherham which was better than those even now in use in the worst-cultivated counties of England and Wales; and that, so far back as sixteen hundred and seventy-seven, subsoiling or loosening the earth very deep so as to let water fall through and fibres of roots to penetrate—one of the most valuable improvements of modern agriculture, which we now owe to Smith of Deanston—was practised by a young man of Kent. But in agriculture, above all other useful arts, improvements and inventions not only travel slowly, but are often despised during the lifetime of the inventor; and, after him, are forgotten.

The frame of the most approved plows is made of wrought, the share of cast iron, case hardened; the coulter, or cutting-knife, being of iron and steel. They are provided with wheels. It requires three or four ploughs of different construction to do the work of a single farm thoroughly.

After the ground has been plowed, it requires to be broken into as fine a condition as possible, to receive seed. For this purpose, on the continent and in Australia, a thick bush is often used, such as Gervase Markham, writing in sixteen hundred and eighty-eight, recommends in his Farewell to Husbandry. "Get," saith he, "a pretty big white-thorn tree, and make sure it be wonderful thick, bushy, and rough grown." The bushy tree was thrown aside for a harrow of wooden spikes; which has since been superseded by instruments of iron, such as harrows and scufflers, or scarifiers, by which the soil is cleaned, stirred, and broken up to a due degree of fineness. Of these several sorts of earth-tortures there were thirty-five exhibitors at Lincoln. With such a choice there is no difficulty in selecting implements which, whatever the quality of the soil, will pulverize the clods left by the plow, clear away the weeds and roots, and cover with earth the seeds sown over the surface.

Next in order come a set of machines invented in consequence of the introduction of such portable manures as guanos, nitrate of soda, soot, salt, superphosphate, &c., which it may be advisable to distribute broad-cast in a liquid state. A few years ago the farmer was entirely dependent on farm-yard manure; which, still valuable, is bulky, expensive to move, and even when dug in, not sufficiently stimulating for certain crops. It is advantageous, for instance, to force forward turnips with great rapidity, in order to place them beyond the ravages of the fly. To this end chemistry is always at work to find or to compound new manures. Bones were a great discovery in their day; but now, fossil bones of antediluvian beasts are, with sulphuric acid, made useful for growing roots to feed Christmas bullocks. Bones were the earliest portable manure used for turnips,—first nearly whole; then crushed; next, on the suggestion of a great chemist, dissolved in sulphuric acid; and now distributed over the land in a water-drill. Portable manures are expensive, and machine distribution is more regular and economical than hand-casting. At Lincoln, mechanical invention was found keeping pace with chemical discoveries. Ten sorts of machines were there for distributing portable manures in a dry state, the last and best being the invention of a young Norfolk farmer, and constructed by a village blacksmith.

The ground manured, is ready for seed. In certain cases both are put in at the same time. The ancient sower—whose race is not wholly extinct—fastened the seed round his waist and shoulder with a sheet, and dextrously cast the grain right and left as he traversed the field; but, in seventeen hundred and thirty-three Jethro Tull, who nearly touched without actually grasping, some of the greatest improvements in agriculture, invented a corn and turnip-drill and a horse-hoe for ridging up and clearing weeds away; an operation only to be done by hand-labour after broad-cast sowing. But in this he was before his time. Yet his contrivance has since been adopted and improved upon sufficiently to yield samples at Lincoln, from thirty exhibitors. Among them were three liquid manure or water drills, which were invented about ten years ago, and pushed into notice within three. These are now making rapid way among the turnip-sowers, in light, level, dry districts.

The horse-hoe naturally follows the drill, whether to scuffle up weeds or to embank earth along the sides of roots. Formerly the great obstacle to the use of implements which enable farm work to be done by mechanism, was a state of society and a system of poor-laws which gave the farmer no choice between paying poor-rates or wages for labourers he was better without; but farmers in eighteen hundred and fifty-four have no fear of surplus labour or of overwhelming poor-rates; consequently, specimens of twenty horse-hoes of every degree of ingenuity were scrutinized at Lincoln, and largely purchased. The latest invention was a rotatory hoe, invented last year by a Norfolk farmer, which thins out turnips with marvellous swiftness and exactness; thus promising to supersede the degrading hand-labour of the Norfolk gangs of boys and girls.

After crops are fairly sown, hoed, and weeded, the next operation is gathering; this brings us to carts and wagons; the wheels of which are made by machinery, at some of the large implement factories, at the rate of thousands per annum. Twenty-one horse carts were shown; and it is to be hoped that by degrees the lumbering, ill-balanced vehicles seen in too many English and Irish counties will be superseded by the light Scotch cart.

But before carting comes mowing, and reaping, and hay-making. In grass-mowing no machine has yet superseded the scythe. But every year spreads more widely the use of the hay-making machine, a revolving cylinder with prongs, which, driven by a horse, lightly tosses the grass, and saves half the work of the hay-maker. Four such machines by different makers were shown; the best were ordered in greater number than the makers could execute. This machine, like the horse-rake (of which a dozen were displayed in the Lincoln yard,) is one of the simple implements that every farmer short of his usual supply of Irish labourers (now better employed in tilling the backwoods of America) should use; for it can be kept in order without the help of a skilled machanic.

The history of the reaping-machine, from the days of Pliny to the contrivance of the Scotch minister, Bell, is too large and interesting to be dismissed in a paragraph. It must for the present be enough to say, that in the field-trials at Lincoln there was nothing more exciting or comical than the straggling competition between the machine reapers, when they charged into the standing corn, and cut and laid it down ready for the binders at the rate of at least two acres per hour. But some other time the story of the reaper—a real romance—must be told.

Passing now from the field to the rick-yard, the rick-stand must not be overlooked. It is a pillar and mushroom cap of stone or iron, to lift the rick from the ground; and to cheat—as we learnt at the late Durham Assizes—rats and mice of no less than forty per cent. of the grain per annum; yet hundreds of farmers will not spend a shilling on rick-stands.

From the rick the next step is to the barn machinery; and what a step!—from the clay thrashing floor, and the flail stupifying the thrasher and wasting the corn; and the rude winnowing machine dependent on a breezy day, to the beautiful steam-driven thrashing-machine, by which corn is thrashed, winnowed, sacked and weighed, while the straw is hoisted to the straw-loft, to be there, if needful, by the same steam power, and by one operation, cut into chaff for cattle. At Lincoln there were upwards of twenty-five thrashing machines exhibited, the greater number of which would thrash corn at about ninepence a quart, or less than half the cost of hand-labour. Yet it is only within the last five years that this machine driven by steam-power has invaded some of the best corn-growing counties in England.

Last in the list comes steam-engines; which steam food, cut chaff, pulp roots, thrash grain, raise loads, pump water, and drive liquid manure through pipes, at an insignificant expense; permitting a farmer to be always ready to send his crops to market at short notice. Without pretending to examine those bewildering conjunctions of cranks and wheels, the mere fact of five-and-twenty steam-engines entered for agricultural use, at prices beginning at one hundred pounds, shows the road the British farmer is now marching. Ten years ago, half a dozen agricultural steam-engines, consuming double the quantity of fuel now required, were gazed upon—in England, though not in Scotland—as curiosities. Now it pays twenty-five makers to send these weighty specimens as showcards to farmers whenever and wherever the Royal Agricultural Society holds its meetings.

The criticism of the practical men who travelled from all parts of the kingdom to review the implement show at Lincoln, proved that a large number of farmers had fully discovered the value of coal and iron—that coal and iron are as effectual in producing motive power for agricultural operations, as for driving spinning jennies, and propelling steam vessels. There is still at least one hundred years of darkness and prejudice between the districts where such sentiments are held, and where the wooden wheelless plow, the clumsy harrow, broadcast sowing, hand-hoeing, flail-thrashing, undrained land, and ill-housed stock, are the rule. Not that any number of implements, or the study of any number of books, will make a farmer. Science, to be useful, must be sown on a practical and fruitful soil. The keenest steel axe must be wielded by a practised hand.

Having raised our crops by a good use of the implements in the Lincoln yard, we must now turn to the live stock.

The short-horns—arranged in order, bulls, cows with calves, and heifers, in the rich variety of colour peculiar to the aristocracy of the ox tribe—come first in view. Some strawberry roan, some red and white, some milk-white; but all so much alike in form and face, that to the uninitiated, the roan bulls might be all brothers, and the white cows all sisters. Short legs, vast round carcases, flat backs; not an angle nor a point, except at the muzzle and the horns—are the characteristics of the descendents of Collings' Durhams. A little farther on, the bulls, quite as large, are the Herefords, red, with white faces, and here and there white bellies; the cows smaller, with less of a dairy look than the short-horns. Third in order appear the Devons, in colour one deep red, with deer-like heads; plump but delicate and small in stature. These three breeds, of which a hundred and seventy-one specimens were sent, represent the best beef that England, after about a hundred years of pains and experiments, can raise. All English herds of cattle maintained on first-rate farms are one of those three breeds—short-horns, Herefords, or Devons. Scotland has breeds of its own. The Argyle ox, in his improved shape, is one of the legacies of Duke Archibald, Jeannie Dean's friend, bred on the hills and vales of the Highlands, and which, fattened in the private yards of London, Norfolk, and Bedford, produces beef second to none. The Ayrshire cow is unrivalled for dairy use. But, as these are not bred in England, they do not come into competition in a show of English breeding stock.

The sheep shown for prizes are subject to as few divisions as the cattle. There are pure Leicesters (once called the New Leicesters; but the old have all died out;) the long-wools, not being Leicesters, of which the prime victors are all Cotswolds; and the short-wools, or South Downs, a class under which rivals from Wiltshire and Norfolk compete with Sussex, the cradle of the improved breed. As for pigs, they are divided into large and small only, although known by many names.

Considering how much of our domestic happiness and public prosperity is dependent on a supply of prime beef in steaks, sirloins, and rounds; on chops, legs, and saddles of mutton; on streaky rashers, and Yorkshire and Cumberland hams, it will not be be time wasted to explain how it comes to pass that in every county of the kingdom there are to be found not only wealthy amateurs, but practical farmers, who devote their whole time to produce prime animals of pure blood, not always at a profit; and how the country gains from stock so plump, cubical, and unpicturesque; for it is not to be gainsaid that the wild cattle of the Roman Campagna or the Andalusian pastures are more suited to figure as models for the painter than under the knife of the carver. A Yorkshire farmer remarked when shown the Toro Farnese, that "there could'nt be many prime cuts sliced out of *him*."

By the exertions of only a few zealous agriculturists, during the last hundred years, good meat has been placed within the reach of the people at large. The roast beef of Old England, which some fancy to have been the ordinary fare of our ancestors in the days of Queen Bess, was really and truly the tough and tasteless produce of lean, black, worn-out draught oxen, or leathery old cows, and that only procurable fresh for four months in the year. Those who have travelled in the South of Europe or on the Rhine, have seen the greyhound-like pigs, the lean, gaunt sheep, the angular and active cows unincumbered with sirloins and almost destitute of lungs, which pick up a miserable existence on the road-sides. A hundred years ago, with a few rare exceptions, the ordinary breeds of live stock in Great Britain were just as lean, ill-shaped, and slow-growing. And to those who inquire what we have gained by the enthusiasm with which noblemen and gentlemen have followed cattle-breeding, it can be answered, that the ox, which used to be with difficulty fattened at six years old, is now presentable in superlative condition upon the Christmas board at three years old. The sheep which formerly fed in summer and starved in winter, until five years old, are now fit for the butcher in twenty months, with a better and more even fleece. And the pig which formerly ran races until two years had passed, is now fit for the knife after eating and sleeping comfortably and cleanly as a gentleman should, for nine months only.

This change has been brought about partly by the improvement of our agriculture, a closer study of the habits of animals, and an increased supply of food placed within our reach by extended commerce, and a rational system of customs duties; and partly by discoveries in the art of breeding. Formerly our cattle and sheep were entirely dependent on natural herbage for their food. In summer they grew fat, in winter they starved and grew thin; having nothing to depend on but such hay as could be saved. The first great step, therefore, towards the improvement of cattle was the employment of the turnip and other roots which could be stored in winter. An experienced farmer calculates that with roots, oxen improve nearly one-fourth more than those fed on hay alone. The use of turnips enabled sheep to be fed where nothing but gorse or rushes grew before. Neal, the mechanic, stepped in with a chaff-cutter, prepared hay and straw to mix with roots, and, with a turnip-cutter, saved six months in getting sheep ready for the kitchen.

The use of a dry, palatable, nutritious food, called oil-cake, which could be carried into the field to sheep to help out a short crop, followed; and further studies proved the use of peas, and beans, and foreign pulse in giving lambs bone and muscle. It was found, too, by experiment, that warm feeding yards saved food; that, in short, the best way of getting stock into prime condition was to feed them well, to attend to their health, and never, from their earliest days, to allow them to get thin.

But before these dicoveries had been made, the breeds of English live-stock were in regular course of improvement. No kind of food can make an ill-bred, ill-shaped beast fat in time to be profitable. Just as some men are more inclined to get fat than others, so are some animals; and by selecting individuals of proper shape with this tendency, certain breeds have been stereotyped into a never-failing type: that type in an ox and sheep is one which presents the largest extent of prime meat and least amount of offal; or, as a South Down breeder expressed it—"a perfect sheep should be, as nearly as possible, all legs and loins of mutton."

To make this improvement, required a certain talent, enthusiasm, and years of patience. Breeders of pure stock, like mechanical inventors, do not, on an average, make money. On the contrary, for the pleasure of the pursuit and the hope of success, they expend large fortunes; while a few win great prizes. But the country gains enormously in result; for now, the same space of ground will feed more than twice the quantity of beef and mutton that it would fifty years ago. The animals not only come to maturity in half the time; but, fed partly in yards or stalls, they spoil less ground by treading, and return to the soil highly concentrated and productive manure.

The first man who made stock-breeding a fashionable pursuit—and that is a great thing in a country where fashion rules too much—was Robert Bakewell, of Dishley, in Leicestershire, the son and grandson of farmers; but, if we mistake not, himself a barrister. With horned cattle he aimed at the cardinal improvements which are now universally established and admitted in this country where the growth of meat—less than the dairy, as in Holland and Switzerland—is the principal object. He tried to produce a large cylindrical body, small head, small neck, small extremities, and small bone. He said that all was useless that was not beef; and sought, by choosing and pairing the best specimens, to make the shoulders comparatively small, and the hind quarters large, which is exactly the reverse of animals allowed to breed freely, and to gallop at liberty over wide pastures. Even the cattle of Australia bred from pure specimens, after running wild for a few generations, begin to lose the fine sirloins of their English ancestors, growing tough and stringy for the spit in proportion as they become active.

In sheep, Mr. Bakewell declared that his object was mutton, not wool; and, disregarding mere size which is a vulgar test of merit, he chose animals which had that external form which is a sign of producing the most muscle and fat, and the least bone; and, by careful selection and breeding, he stamped a form on the Leicester sheep which it retains to this day.

The South Downs, doubtless an indigenous breed, feed on the bare pasture of the Southern coast, produce a fine quality of meat, and a close, short wool. It was the turnip that rendered feeding the South Down while young possible. The great improvement began with John Ellman of Glynde, near Lewes, in the year seventeen hundred and eighty. He preserved the form of the original breed, but corrected the too great height of the fore quarters, widened the chest, made the back broader, the ribs more curved, and the trunk more symmetrical and compact. The ancestors of the present race were rarely killed until the third or fourth year. They are now sent to execution at two years, and sometimes even at fifteen months old. They have since spread far; superseding the breeds of Berkshire, Hampshire, Wiltshire, crossing and altering the Shropshire, extending into Dorsetshire, Surry, Norfolk, Devonshire, Herefordshire, Wales, and even towards Westmoreland and Cumberland, and have improved all the breeds of black-faced heath sheep.

The crowning events in the history of beef and mutton bring us back to agricultural shows, which were established by James Duke of Bedford at Woburn, and by Mr. Coke, afterwards Earl of Leicester, at Holkham. At these "sheepshearings" the great houses were thrown open to agriculturists of all countries and counties. Stock were displayed, implements were tried, prizes were distributed, and gentlemen of rank and fortune, of all opinions and politics, threw themselves with enthusiasm into agricultural discussions, and enjoyed the excitement of hospitality, competition, and applause. For instance, in seventeen hundred and ninety-nine, we find in the Gentleman's Magazine, in an account of a Woburn sheepshearing, held on the twenty-first of June, names since become classical in connection with pure breeds: Coke of Norfolk; Quartley, from Devonshire; Parsons from Somersetshire; Ellman, from Sussex; worthy successors, in the cattle-breeding art, of Bakewell, the brothers Collings, Tompkins, Lord Somerville, and several others. "From one hundred to a hundred and ninety sat down to dinner for five days successively. Premiums for cattle, sheep, and plowing were distributed, and his Grace let about seventy South Down and new Leicester rams for one thousand pounds. The conversation was entirely agricultural, and the question was discussed whether the new Leicester or the South Down were the better breed of sheep."

Lakes

Are insoluble compounds, formed by precipitating coloring matter with an earth or oxyd. The chief lakes are *carmine*, obtained from cochineal by precipitation with Roman alum; *Florence* lake, prepared by the same process from the sediment of cochineal, by precipitation with solution of tin; and *madder* lake, prepared from Dutch crop madder by precipitation with alum.

Scientific American.

Champagne Wine—Some Curious Facts about it.

Where one line has been written in America about champagne, an hundred baskets have been drank. It is, *par excellence*, the fashionable and the favorite wine of the Americans. It is always on our dinner tables—we call for it from the frescoed ceiling of our New-York-hotel diningrooms, till we reach the outskirts of our Western wildernesses. We call for it in the cabin of the steamship, no matter on what ocean she is floating—we drink it at the head-waters of the Missouri, at the cataracts of the Nile, at the sources of the Amazon, on the vales of the La Plata, and at the falls of the Ganges. If there be a good genius in wine (and a thousand inspired odes to Bacchus have said there was) that good genius lurks under the champagne cork. It is a wine better suited to our climate than any other, for it has the inimitable gift of creating an impromptu inspiration; and even when used with a hardly justifiable freedom, the mists which it scatters over the memory are more readily dispersed by a few hours of balmy slumber, and the invigorating breath that comes with the pure air of the rising sun.

And yet we have taken very little pains, and had very little curiosity, to learn the origin and history of this unrivalled accompaniment to the scenes of joyousness and luxury that brighten and embellish our social life. We will furnish such a brief history of champagne wine, as the fruit of our observations in the champagne districts of France, where all the champagne of the world that is genuine is made, can give. Champagne is an artificial wine. Perhaps it would be better to say a compound wine; for in no instance is it the simple juice of the grape, corked up after fermentation. It may, when well made, be quite as pure; but certain elements are combined in the manufacture of a fine champagne, for which we depend solely upon art. Therefore the quality and flavor, and the value of champagne, always depend upon the flavor of the ingredients used in the manufacture, the processes by which it is carried on, and the skill with which it is perfected.

There is no champagne of reputation that is made without being composed of a mixture of the wines of various vintages, or vineyards.

All the champagne wine worth speaking

of in the world comes from the Champagne district, which is about thirty miles long and from one and a half to three miles broad. The river Marne flows through the whole district, augmented by the numerous tribute streams that come rippling down from the circumjacent hills. This is the only district of France where grapes are grown which produce a juice specially adapted to a champagne wine. There is, indeed, the sparkling hock of Germany, and the *vino d' Asti* of Italy, both of which have, in a natural state, some of the qualities, especially the effervescing ones, of champagne. But, in no part of the world have soil, science, labor, or capital, combined with success to produce real champagne except in the beautiful valley of the Marne. There are the favorite spots for growing the champagne grape—as famous as the vineyards on the south side of the island of Madeira, which from the period of the Romans, has been known as the chief seat of that delicious grape which makes Madeira. So, too, along all the southern slopes of Spain and Italy, and through the extent of the Mediterranean, between the bases and the summits of the hills, where neither the moisture of the valleys nor the chills of the mountains interfere with the genial and delicate process of maturing the luxurious grape.

It is well known that the flavor of all wine, in a natural state, depends upon the chemical qualities of the soil, the dryness or the moisture, the heat or the cold of the atmosphere, and other natural causes, which in the invisible and beautiful operations of chemistry, produce these results. The odor of the flower depends not alone upon the species, or even the family to which the plant belongs. Some species, by being transplanted, change their perfume; and some have been known to lose it altogether. It is one of the nicest and most delicate and difficult problems in agricultural chemistry, to ascertain how the highest flavor or ordor can be infused into the plant, or the flower.

In the Champagne district, as well as in many other vineyard regions of France, and other wine countries, the grape is cut down, within from two to twelve inches of the ground, every year after the vintage is gathered, and the sap has retired to the root. Our vine-dressers in America may learn a lesson from this. If we would cultivate these varieties of grapes, this pruning should be thoroughly done in the Fall. This is true of all grapes which produce their fruit from the new growth of the stock exclusively. and why all the pruners should cut everything down to near the surface, leaving only the eyes, from which the germs of the next spring will burst.

Our American readers must not fancy the Champagne district to be one of the warm, blushing valleys of the south of Italy. This district is the latitude of Canada, and they have cold winters there. So when the process of pruning the grape in the Fall is finished, the remaining stock is protected sometimes, and all the grapes that are to be grown next year, must come from the new shoots. When thus cared for, the grape vine takes to growing in the root, and these roots elongate themselves sometimes for enormous distances. In Italy, and in some other portions of Europe, we have seen grape vines run immense distances, with branches lopping down and rooting again, and still growing with the utmost luxuriance, when the parent stock itself had rotted off above the ground from which it grew. Thus it is no uncommon thing in Italy to find grape vines that have been in the soil, probably for ages, producing from the original root or branches that sprung from it, without transplanting, for a period of 500 years. This fact is so well known to students of Oriental history, that it grew into a proverb at least four thousand years ago, when in "the good time coming" of the prophets of Judea, it was declared that every man should sit under his own vine and fig tree, having none to molest or make him afraid.

Some grapes attain their perfection in four, five, or six years. This is the case generally with the champagne grape.

The champagne grape produces from one, to half a dozen bunches on every stock, except in poor years, as they have recently experienced several in France. But there is no relaxation in setting out new plants, or forcing the yield, whether it be a good or bad year. Neither science nor experience has yet been able clearly to ascertain the causes of failure of the grape crop.

The champagne grape matures later than many other varieties, chiefly because it has greater acidity. The champagne vintage begins about the 20th of September, and ends by the 15th of October. This period there, resembles the season of cotton picking in the South, when the whole force of the district is called into requisition, and they work on night and day. In both cases, the labor must be done quick, for a heavy storm, or a long period of damp weather, would produce ruinous consequences, leaving the grapes so wet, that even if ripe, they would become mouldy and musty, and the exquisite aroma be utterly destroyed.

Great pains is taken in the process of getting the juice out after the grapes are gathered. They are brought in baskets, and on being delivered, are carefully looked over by the hands in the establishment, when the best clusters are placed in large tubs, containing one or two hundred pounds each. These grapes are purchased by the buyers of large establishments, who are always on the spot, with their orders or money. When a sufficient quantity is collected, they are carried to some place in the neighborhood, where they are pressed; and thus a fair experiment is made, and the result known. The juice is then sold to the larger dealers. But recently the more common mode has been for the large manufacturers of champagne to send their agents out through the grape districts, to purchase the grapes themselves, and do their own pressing. They thus find that they can produce a greater uniformity of quality, and assimilate their different wines into a more perfect compound. The present manner of pressing grapes does not differ essentially from what we call, in New England, the old fashion cider press. On a platform of from four to twelve feet square, the grapes are thrown into what cider-makers will understand as a cheese; and through the orifices in the bottom and in the sides of the press, grapes will, by their own weight, exude the juice, which is of course the purest and the best, not being mixed with any impurities that come with the clusters when impregnated with any of the bitter or obnoxious flavor of skins or stems. In any vintage the juice gained by the first process is the finest. But the juice of the grape has to be produced by artificial pressure, which forces it out, and although sometimes differing in color—the coloring matter being chiefly in the skin of the grape, since the juice of nearly all grapes is very much alike in appearance—it is perfect.

Very little of the champagne that we use is made from the first quality of juice. It never could be manufactured and sold for the prices of a sham article. It is dealt in only by houses of the first reputation. Most of the champagne drunk in America comes from suspicious quarters, and we may be very thankful when we get the fruit of the grape: for, except in rare cases, we are sure to be deceived.

The juice of the grape being thus collected into a thousand or ten thousand pipes, the fermentation must first take place. This is completed in a few days, when the taster of the establishment (no mean personage) goes through, and ascertains the amount of acidity on the one side, and saccharine matter on the other, in every cask. Whichever quality is lacking is supplied at once by adding sugar in the one case, and wines of a different quality in the other.

It is a nice process to determine and regulate the flavor, the bouquet, and the body of the champagne wines. It is well known that manufacturers of the greatest experience and reputation, have had more faith in learning to discriminate in the natural qualities of different vintages of the champagne wine, than they have had in the application of chemical ingredients of an artificial description. Thus the wines of different fields, or even different vintages, are successfully combined by skillful tasters, who thus produce a result finer, perhaps, than could be reached by the production of any one vintage whatever. The taster is the man upon whose judgment the process depends.

Thus, when the mixtures are complete, the wine is put into large vats, containing from a thousand to five thousand bottles, where it remains until it is drawn off. By this time it has perfected itself as far as it can, when it is put into bottles and deposited in the coldest cellars that can be made. When the spring comes on, the second fermentation of the wine takes place, and this is often attended with a heavy loss by the breakage of bottles. But those which stand the racket are then carefully wired for a year or two, and laid down flat, when a sediment gathers on the lower side of the bottle. The bottles are afterwards turned to stand perpendicular, and shaken every day, until the sediment which forms comes to the top, leaving the wine clear. After this period the bottle is not disturbed until the final process is reached, when this sediment must be got rid of, and it is to be done by a very rapid and skillful movement.

The string is cut and the cork goes off with a pop, and with it all the sediment that had been collected. Then a small percentage of the finest crystallized sugar, with from one to three per cent. of the best brandy in the world, is added to supply the vacuum made by that small portion of wine which escaped. The bottle is instantly corked firmly, and the wine is ready for exportation.

The reason for putting some sugar in, is to overcome the asperity, roughness, or even bitterness, which might be detected in the best vintage by a fine palate; and this infinitessimal quantity of brandy is added as a corrective, to produce a chemical whole, combining and blending all the elements together. A powerful machine drives the cork home, and thus from five hundred to ten thousand bottles a day, pass through a great establishment. The government of France reported last year something like sixteen millions of bottles exported. The German States consume five millions, while England takes only about six hundred thousand; France, Belgium, and Spain, consume but two millions; other smaller nations in the aggregate use but two, and the balance comes to the United States.

It will thus be seen that we drink more champagne in America than all the rest of the world put together. Every quality of it is sent here, and almost any quantity without labels, that each dealer will put on what label will best suit his customers, varying the price as he can make it, for it is absolutely within our own knowledge that we have drank champagne of all prices and all brands, at the same table, when there was but one quality of champagne under all the brands, and that of the most infamous description.

The most popular, and the most reliable champagne wine known in America, has for more than a generation been the Heidsieck champagne. More bottles of that brand have been sold in America than of any other; and our readers being more familiar with it, we will add one word of history in regard to the name. The facts we are about to state, we give with some confidence, for we get them from Rheims, the head-quarters of champagne.

There are three houses in Rheims that make use of the name Heidsieck on their corks. The first member of the Heidsieck family that established himself at Rheims, was a Mr. Florent Heidseick, the great uncle of the gentleman now known throughout the world as the proprietor of the *Charles Heidsieck champagne.* They have merited the confidence of the commercial world—they have always had an agency in New York, and only one agency at a time. That agency is now at 100 Pearl street, with the firm of T. W. Bayaud & Co. This is the only place in America to go to, to have the genuine Charles Heidseick champagne.

Democratic Age.

Printer's Devil.

We have so frequently been asked by friends and others, why the boy in the printing office is called the "devil," that we conclude to give what little we know upon the subject.

The first persons who carried on printing to any extent, (if they were not the actual inventors of the art, as asserted,) were John Guttenburgh, John Faust, (or Faustus,) and Peter Shæffer. Germany was the place the art was invented and first carried on. The following story is told of the first introduction of printing in France:

"In 1592, Faust carried a number of Bibles into Paris, which he and his partner (Shæffer) had printed, and disposed of as manuscripts; at this time the discovery of the art was not known in France. At first he sold them at the high price of five or six hundred crowns, the sum usually obtained by the scribes. He afterwards lowered the price to sixty, which created universal astonishment; but when he produced them according to the demand, and even reduced it to thirty, all Paris became agitated.

"The uniformity of the copies increased their wonder, the Parisians considering it a task beyond human invention; informations were given to the police against him, as a magician; his lodgings were searched, a great number of Bibles were found and seized; the red ink with which there were embellished was said to be his blood. It was seriously adjudged that he was in league with the devil; whereupon he was cast into prison, and would most probably have shared the fate of such whom ignorant and superstitious Judges condemned in those days of witchcraft. He now found it necessary, in order to gain his liberty, to make known his discovery of the art. This affair gave rise to the tradition of 'the Devil and Dr. Faustus,' which is handed down to the present time."

The ignorance and superstition that considered printing an invention of the Evil One, would also very naturally suppose the men engaged in it as being the servants of Satan, if not actual fiends in human shape. It is universally considered that the above story gave rise to the practice of calling the office boy by the name of "Devil."—"*Printers News' Letters*"

Wanted—A Young Man of Industry, Integrity, &c.

This meets one's eyes daily in the columns of "Wants," and it is true as the Pentateuch. Wanted! Of course they are —always wanted. The market can never be overstocked; they will be called for, and never quoted "dull" or "no sale.". Wanted for thinkers, wanted for workers; on the main, in the field, and in the vast forests.

Tools are lying idle for want of young men, a pen is waiting to be wielded, a tree to be felled, a plough to be guided, a village to be founded, a school to be instructed.

They talk about staples and *great* staples. Honest, industrious, able young men are the staple in this world of ours. Young man, you are wanted; but not for a doctor. No; nor a lawyer. There are enough of them for this generation, and one or two to spare. Don't study a "profession," unless it is the profession of bricklaying or farming, or some other of the MANUAL professions. Don't use tape if you can help it. It is honorable and honest, and all that; but then, perhaps you can do better. Of all things, don't rob the women. It is their prerogative to handle silks and laces, tape and thread. Put on a hat like a man, don an apron, and go out of doors. Get a glow on your cheeks, the jewelry of toil on your brow, and a good set of well developed muscles. We would go, if we could; but then we were young longer ago than we like to think, and you know when one's "old he can't."

Besides, if you become a doctor, you'll have to wait. "Because you haven't experience," says an old practitioner; "because you are too young," says all the women. If you are a lawyer, and likely to rise, they will put a weight on your head, a la Swiss, to keep you under; or if you make a good argument, some old opponent, as grey as a rat, will kick it all over by some taunt or other, because you were not born in the year *one*. And so it will go, until you grow tired and soured, and wish you had been born a tinker, perhaps an immortal one, or anything but what you are.

Be a farmer, and your troubles are over, or rather they never begin. You own what you stand on, from the centre of the earth up to the skies, as they used to say; you are as independent as possible all day, and tired, not weary, at night, for there is a great difference between the two words, if one stops to think about it. The more neighbors you have, and the better farmers they are, the more and better for you.

There is one thing, young man. You are wanted. A young woman wants you.—Don't forget her. No matter if you are poor, with proper economy you will soon be rich and happy. Don't wait to be rich. You need a companion while you live, and not after you have done living. Effort is life, and cessation therefrom a grand and gloomy "has been." So do not wait till it is all in the yesterdays; if you do, ten to one if you are fit to be married. Marry while you are young, and struggle up together, lest in years to come somebody shall advertise "Young Men Wanted," *and there's none to be had.—B. F. Taylor.*

Leaks Simply Stopped.

The *Lynn News* says:—"Some years ago I had a leaking 'L.'* Every northeast storm drove its waters in. I made a composition of four pounds of resin, one pint linseed oil and one ounce red lead, applied it hot with a brush to the part where the 'L' was joined to the main house. It has never leaked since. I then recommended the composition to my neighbor, who had a dormer window which leaked badly. He applied it, and the leak stopped. I made my water-cask tight by this composition, and have recommended it for chimneys, etc., and it has always proved a cure for a leak."

* The valleys of an L shaped house.

For the Southern Planter.

Palpitation of the Heart.

Mr. Editor—The remedy for this uncomfortable affection which you mention in your February number as recently recommended, viz. "deep inspirations and subsequent holding of the breath," I accidentally discovered thirty years ago, and have since always used when necessary.

I mention it not in derogation of itis originality, but in confirmation ef its efficacy.

February 1859. SUBSCRIBER.

Gypsum—Who Introduced It?

The Editor of the Southern Planter will find herewith an article on the first introduction of gypsum, which was elicited by enquiries which I was induced to make of some friends in Pennsylvania. It was sent to me in manuscript for the Planter, but was soon after published in the American Republican and Chester County Democrat. Chester County is one of the finest farming districts I have seen, and this account of the introduction of gypsum is most satisfactory, and will be useful I hope in reviving its reputation, lately overshadowed by guano. My own firm conviction is, that the more guano is used the more plaster should be. In proof of the strength of my convictions, I remark that I use from 10 to 20 tons of guano, and from 40 to 60 tons of plaster. A farmer may profitably use a bushel of plaster every year for each acre of land he has in grass or under cultivation; and it is undeniably the cheapest of all fertilizers. Use others as far as prudence may justify—but do not fail to use this *freely*.

THOS. W. MERIWEATHER.

[*From the American Republican.*]

In view of the important results which the use of Plaster of Paris as a fertilizer has produced in our agriculture, the interesting question presents itself, "Who first introduced it to the notice of the farmers of this country."

To Franklin, among others, has this merit been ascribed. It has been reported of him that, whilst residing in France as our Minister, having observed the importance of plaster to the agriculturists, upon his return he determined to present it to his countrymen by an ingenious devise. He is said to have strewed plaster upon a public lot, so as to form this sentence, "This is Plaster of Paris;" the increased luxuriance of the grass where the plaster was placed, attracting the notice of farmers, induced them to adopt its use in their agriculture. This anecdote is so like Franklin that it seems to have obtained extensive credence; investigation, however, disproves its correctness. But as Pennsylvanians, we have reason to congratulate ourselves that the merit is due to our late distinguished fellow-citizen, Judge Peters. The following letter from N. B. Worthington, Esq., assistant Editor of "The American Farmer," to Doctor Thompson, of Washington, many years President of the Delaware State Agricultural Society, places this matter in a clear point of view:

OFFICE OF AMERICAN FARMER,
BALTIMORE, March 8th, 1858.

Dr. James W. Thompson:

DEAR SIR:—Mr. Sands has handed me your letter addressed to him, and making inquiry as to the introduction of the use of gypsum into this country. Having had occasion recently, in preparing an article on the subject of gypsum for the Farmer, to look into the matter, it gives me pleasure to be able to give you the desired information.

I do not find in the first place, either in the *memoirs of the Philadelphia Agricultural Society* nor in the old series of the American Farmer, that the credit of its introduction is anywhere given to Dr. Franklin. On the contrary, in both of these works, but especially the former, there is abundant evidence that the credit is justly due to Judge Peters, of being the first to test its value, and in the most industrious and persevering manner, to bring its valuable qualities to the notice and knowledge of the agricultural community.

His own experiments with it, commenced about the year 1772, and his own observations, through many years, and the results of a most laborious correspondence are embodied in his "*Agricultural inquiries on Plaster of Paris*," published first in 1797 and reprinted and bound up with the 2d volume of the memoirs of the Philadelphia Agricultural Society in 1810.

Of the circumstance of the first introduction of gypsum, Judge Peters gives the following account in a paper read before the Philadelphia Society in 1807, and which will be found in volume 2d, page 161 of the memoirs.

"The first time I saw the agricultural effects of the gypsum was several years before the commencement of the Revolutionary war, on a city lot, belonging to, or occupied by Mr. Jacob Barge, on the commons of Philadelphia. He was the first person who applied gypsum to Agricultural purposes in America; but on a small scale. He showed me a letter in German, from one who had gone over from Pennsylvania to Germany for redemptioners as was customary at that time. The writer sent over a specimen of the gypsum, and desired Mr. Barge to seek for land in this, then province, in which it could be found. He wrote Mr. Barge word that the discovery was then of no long standing in Germany, and that it had been accidently made by a laborer employed at mixing stucco mortar at a large building—the path along which he passed to his home, threw up on each side a luxuriant growth of clover, which he attributed to the dust from his clothes, and made experiments which resulted in the discovery." "Burr millstone makers, and stucco plasterers," continues the judge, "were the only persons acquainted with any of its uses in this country. From one of the former I procured a bushel; which enabled me to begin my agricultural experiments; and I faithfully pursued and extended them as I obtained more means. A quantity imported as ballast, (I believe 20 tons) and thrown on a Philadelphia wharf, without a knowledge of its value, was the first important foundation on which the extensive improvement of our husbandry was established. When I had convinced myself of its efficiency, I disseminated the knowledge I had acquired, through many parts of Pennsylvania; and sent samples to Jersey; New York, and I think Delaware, (then called the lower countries) and Maryland. In the same paper the Judge makes mention of an English turist, Strickland, and calls his statement with reference to the introduction of plaster, an item in the catalogue of his mistakes.

"He attributes the introduction of plaster into this country, to the Germans of Lancaster County, in this State. But this assertion is entirely unfounded. When I first sent samples of gypsum into that county, very soon after I was acquainted with it, I perceived the Germans there to be totally ignorant of its existence, and of course of its agricultural uses. More than ten or twelve years elapsed before they could be prevailed on to use it freely."

In the 7th volume of the American Farmer, first series page 20, is an extract from an address of Robert Vaux, before the Philadelphia Society, which fully confirms Judge Peter's account of the matter; nor can I learn that it was ever questioned by any one professing a knowledge of the circumstance.

Nor did the Judge confine himself to making known the value of this fertilizer. He set on foot inquiries and investigations which led to the discovery of gypsum in great abundance on this continent—by which means it is furnished us now at so low a rate as to bring it within the means of the most poverty-stricken.

In the range of new things, and perhaps in some measure on account of its very cheapness, gypsum is comparatively out of fashion. The article on the subject in the last Farmer, was written for the purpose of directing attention to its great value. Such a paper as you propose would, no doubt, aid that design, and we shall be very happy to receive it, or any thing else with which you may favor us.

Yours dear sir, very respectfully,

N. B. Worthington.

The Native Merchants of India and China.

The statements of intelligent voyagers and travelers all concur in the opinion that the greatly increased commerce between these Eastern nations and England, and the United States, with the high prices which have been paid for the products of those densely populated regions of the Asiatic continent, have given enormous wealth to the shrewdest of the native merchants, and that the profits realized by them are vast and beyond calculation. So strong have they become that they make their own prices, and have altogether the upper hand of the European traders, except the Greek merchants, who from long experience and assimilating to a great extent with the natives, have become in reality merchant princes. The immense commerce of Calcutta is, to a great extent, controlled by two or three Greek houses.

In China, many of the native merchants are exceedingly wealthy and transact extensive business. It was stated a short time since, that in the English island of Hong Kong, on the coast of China, near Canton, of one hundred square-rigged vessels in the harbour, eighty were either owned or chartered by the Chinese merchants. The great proportion of house servants, store porters, clerks, mechanics and laborers, in Hong Kong, are Chinese; while the petty shop keepers, cattle drivers, boatmen, etc., are mostly Malays. Many of the Asiatic nations are largely represented at Hong Kong. There are also many Greeks and some Arabs. Of the Chinese population, estimated at 70,000, only about 300 are women.—*N. O. Bulletin.*

The Wool Trade.

The comparative table of imports of wool at Boston, as per George Wm. Bond & Co.'s Circular, as follows:

	1854.	1855.	1856.	1857.	1858.
England	1,031,879	325,529	41,375	3,126,883	1,162,898
Buenos Ayres	3,973,936	970,810	1,883,125	2,260,011	1,643,857
Turkey	4,315,380	3,195,367	2,505,590	5,241,082	2,001,792
France	388,396	204,785	33,691	507,236	22,053
Cape of Good Hope	450,487	117,680	570,740	2,506,716	1,984,372
Brazil	5,606	..	32,958	5,496	..
Peru and Chili	2,533,609	2,402,601	3,211,467	3,045,440	3,578,446
British Provinces	473	1,063	4,619	24,191	13,252
Dutch West Indies	3,170	..	..	..	..
Malta	491,154	..	142,722	293,023	..
Scotland	73,855	..	..	..	..
Tuscany, &c.	32,163	..	..	..	58,500
East Indies	12,974	..	..	281,026	64,213
Austria	176,733	..	..	107,771	..
Spain	..	..	..	74,451	..
Russia	..	..	..	356,034	..
Sandwich Islands	..	..	..	2,440	9,805
Northern Africa	..	..	..	131,281	..
Sundries	1,948	24,980	..	..	1,751
	13,398,503	7,245,996	8,425,807	17,941,081	10,550,849

U. S. Economist.

Cotton Trade of England.

The returns of the British trade for eleven months, to the close of November, show some very singular results, as compared with the previous year. The imports of raw material in Great Britain have been as follows:

		1857.	1858.	Decrease.
Cotton	cwts.	7,667,051	8,050,914	....
Flax	cwts.	1,776,023	1,172,204	603,819
Hemp	cwts.	702,783	740,174	....
Silk, Raw	℔.	9,605,493	5,686,423	3,919,070
Silk, Thrown	℔.	607,890	340,667	267,223
Wool	℔.	110,995,577	107,519,851	3,475,726
" Alpaca	℔.	2,200,177	1,998,531	201,646

The increase in cotton is altogether from the United States, the decline being nearly one-half from India. The decline in the receipts of materials from India and China is as follows:

		1857.	1858.	Decline.
Cotton	℔.	223,677,300	121,552,700	102,124,600
Silk	℔.	8,918,680	5,130,477	3,788,203
Wool	℔.	16,922,118	14,662,804	2,259,314

This gives a decline of over $35,000,000 in the value of produce received from Asia. On the other hand the value of cotton alone sent in that direction has been as follows:

	1857. Yards.	1858. Yards.	1857. Value.	1858. Value.
China	110,760,781	123,134,830	£1,421,030	£1,614,408
East India	422,295,299	723,962,287	5,147,372	8,497,189
" Yarn	17,080,349	33,188,226	994,890	1,763,125
Total			£7,565,292	11,874,772

There has been a value of $15,000,000 less cotton received from India, and a larger value by $22,000,000 exported thither, making in that article alone a balance more favorable to England than last year. The result is not very encouraging for a supply of cotton from that country. The same result must necessarily attend any movement in new countries for the planting of cotton. The demand for clothing will always far outrun the ability to raise the materials, but the material and the demand may both grow so as to employ British machinery in that new field of enterprise. There can never, however, be derived a larger supply applicable to the wants of present cotton users. The aggregate exports of cotton goods from Great Britain for the 11 months, has been as follows:

	1857. Yards.	1858. Yards.	1857. Value.	1858. Value.
To United States..............	169,985,234	124,535,675	£2,933,432	£2,102,554
Elsewhere..................	1,678,390,741	1,984,756,386	23,943,190	26,903,177
Total..............	1,848,375,975	2,109,292,061	26,876,622	29,005,731

This is an unusual development of the cotton trade. The export of weight in goods is 107,000,000 ℔ greater, and the import weight of raw material 44,000,000 ℔ greater. Hence, a larger amount of cotton in the aggregate has been exported than imported, while to the United States alone the reverse is the case, there having been more cotton received there and less goods sent. The result shows a remarkable health in the cotton trade, as well as in the general state of business.—*Ib.*

Cotton Manufactures of Great Britain.

The documents of the State Department contain the following comparative figures of the cotton factories in the United Kingdom:

	1856. England.	1856. Scotland.	1856. Ireland.	1856. Total.	1850.
Factories..................	2,016	152	12	2,210	1,932
Spindles..................	25,818,516	2,041,629	150,512	28,010,217	20,977,017
Looms..................	275,670	21,624	1,633	298,847	249,627
Males..................	148,354	7,609	1,223	157,186	141,501
Females..................	192,816	27,889	2,122	222,027	189,423

The number of spindles, it appears, increased 40 per cent., and the number of looms 20 per cent., but the number of male hands employed only increased 11 per cent., and of females 15 per cent. This fact shows how much more cloth was produced in 1856 without manual labor than in 1850. If the looms produced only about the same number of yards each, then 20 per cent. more cloth was produced in the aggregate, with only 10 per cent. increase in the hands, but the number of yards resulting was much greater. The official reports give the number of lb of yarn spun in 1850 at 526,125,000 ℔, or 24¾ ℔ per spindle. In 1856, the weight spun was 819,375,000 ℔, or 29¼ ℔ per spindle, showing an average increase of production of 4½ ℔ per spindle. The number of yards produced in 1850 was 1,188,544,000 yards, or 4,750 yards each loom. In 1856, the product was 1,934,265,300 yards, or an average of 6,447 yards per loom, being an apparent increase of 35 per cent. in the make of each loom. Such has been the apparent increase in the improvement of machinery, by which its productive power has swelled the number of yards, that the same number of hands can turn out. The same result has manifested itself in this country with greater force. Annually, the number of people required to produce a certain number of yards is diminished, and with the diminution the cost of production. When machinery comes in so marked a manner to supply the labor of hands, that difference which was formerly supposed to exist between the cost of labour, and these become equalized, since machinery will work as cheaply here as there, and to this circumstance no doubt is due the rapidity with which American goods supplant the imported ones of late years, and the increasing weight which the same duty has upon a particular class of goods. This applies to cotton and dress goods which come more directly into competition with the imported articles. There is no reason why all that pertains to skill, design and machinery should not take that lead in this country, if the supply of mere labor is less. The main difficulty is, however, that the labor here is not sufficiently divided. In woolens, particularly, the branches of the business should be separate and conducted each by responsible heads, as yarn workers, weavers, dyers, finishers, &c., as is the custom abroad. The acquired skill and economies of each department make a much cheaper aggregate in the finished cloth than when all these departments are conducted by a corporation, which employs persons not directly interested in or responsible for the economy and perfection of the details. There is here great room for reform.—*Ib.*

The Southern Planter.

RICHMOND, VIRGINIA.

Articles intended for publication in our paper should be marked, "For the Southern Planter."

Do not write on both sides of the paper. If this rule is not regarded, mistakes are very apt to occur in printing.

Letters containing money, or pertaining to business connected with this paper, should be directed to August & Williams, or to the Southern Planter, *and not to the Editor individually.* This last request we make because we do not attend to the keeping of our books, and do not always see the letters as soon as they come to the office.

TO CORRESPONDENTS.

We are always grateful to gentlemen who furnish us with well written articles for our columns; but they would lay us under additional obligation, if they would *leave their names with us*, when they are too modest to append them to their communications. Frequently we wish to write to them and to ask for further favors from them in the epistolary line—but cannot do so, in consequence of not knowing to whom we shall address our letters. If each correspondent (of every Agricultural Journal) would give with his communication, his name and address, we believe it would be the means of producing much benefit, by eliciting a lively and more constant interchange of opinions and agricultural experiences, among all who are interested in agriculture and its associate branches. The chief benefit, we think, would result from the good example set the diffident, who would perhaps follow, when they would not lead. In this manner we should have a greater variety of subjects introduced through the Journals, with of course a fuller description of them, and more light, and more interest added to every department of science in which farmers should have an especial desire to make safe and sure progress.

Explanatory.

The "Devil" of our Printer's establishment, has lately played us a prank, which proves very troublesome to us in its consequences. *He*, with the spirit of mischief ripe in him—altered our card offering (when more than half the year had transpired) the Southern Planter for 1858, at one dollar and a half per annum, so as to make it appear that we charged only this sum for the present volume.

We knew nothing of this misprint until an old subscriber called at our office, and directed our attention to this change, of our notice, *too late for correction in the February number*, most of our subscribers, having had the paper mailed to their address. It is almost useless to say therefore, that *this card was entirely unauthorized by us.* It has caused us a great deal of vexation, besides much loss of time in explanatory correspondence.

We would be very glad to have it in our power to furnish the Southern Planter to every body at a less price than we are compelled to ask for it now—but unfortunately we cannot afford to print it, at any price less than $2 per annum. We suppose that the fact is well known to the public, that many accounts standing on the books of all subscription papers, are a dead loss to Editors. We are no more exempt from such loss, than the rest of our brethren, and can only do the best we can under all circumstances, to furnish the Planter at $2 a year *as long as it will pay its own expenses.*

If, therefore, any subscribers who (in consequence of the printer's mistake in dates) have sent us one dollar and fifty cents to pay for the present volume, think they cannot, or will not take the paper at our established price, we will render them all the amends in our power by refunding them their money, upon application.

Our offer to furnish the Planter for 1858 at

$1 50, was made late in the year, in order that we might get rid of a large supply of "*back numbers*," which we had on hand at that time.

We are very sure that we shall not incur the censure of a single generous man, in consequence of the mistake referred to—while we very greatly regret its occurrence.

Fine Stock, Cattle, &c.

We will be obliged to those of our subscribers, who own fine stock of any sort, if they will furnish us with descriptions of them.

We want to know where they may be found, that we may have it in our power to furnish information on this point to those of our friends who make inquiries on this head, at our office.

We will readily forgive them, if they *brag* a little sometimes, as we think a man very excusable for pride of ownership, when he has a beautiful animal, which by his skill, energy, and care has been rendered attractive in appearance, or valuable for good qualities.

Mr. S. W. Ficklin of Albemarle county, has kindly sent us Alexander's catalogue and history of the Short Horn or Durham cattle. We return our thanks for it, and give in our present number an extract from it, which we think will be interesting to our readers.

Mr. Ficklin is himself a successful and liberal breeder of fine stock, and we take the liberty of making the following extract from his letter to us. Speaking of Short Horns, he says:

"I have a four year old bull—three cows, &c. Heifers in calf, and a five months bull calf. Also some twenty odd nearly thoroughbred cows, and heifers in calf to my bull.

"I have, by way of contrast, a fine Devon cow, and an Alderney bull calf. But Short Horns are the cattle for all who will give them a good share of grass, and *rational* winter keep. They will mature at three and a half years—are better for beef—as good as Devons as milkers, but *not equal* to them as work oxen."

Peabody Corn.

We have received a letter from one of our subscribers, in which this corn is highly praised. This is the first word of commendation, we believe, ever sent us of this high priced article. We notice in the *Southern Farmer* a communication from one of its correspondents, who has had a very different experience from our friend. We have never tried it, and never will, as long as it is sold at so high a figure.

Last year we planted some corn raised by Dr. John R. Woods, of Albemarle, Va., and some of the "Hicks' Prolific." We were much pleased with both varieties, as we made a good crop, in spite of an unfavorable season. We paid for the "Hicks' Prolific," $2 a bushel. A neighbour of ours, who planted it in the spring of 1857, told us he made on a piece of meadow land rather more than ten barrels to the acre.

We append an extract from one of our exchanges.

"I have no allusion now to patent churns, patent washers, patent coffee-pots, or even to patent medicines, but I allude to a certain kind of remarkably prolific corn, originated, puffed and sold, at a great profit, by Mr. Peabody, of Georgia. I was fortunate enough not to get caught in this trap myself; but I have no doubt many did, and, like Franklin, found, when too late, that they had 'paid too much for their whistle.'

"I was presented by a friend with a handful of this Prolific corn, planted it in good ground, at a good distance from all other corn, and cultivated it with care, and the result was, that not one-fourth of the stalks had even two ears on them, and all of a very diminutive size. If any others have had better success, Messrs. Editors, I should like to hear from them. J. R. B.

Fine Horses.

Our advertising sheet contains the pedigree, &c., of "Trojan," a thoroughbred Premium Stallion, and a fine specimen of this class of horses. Also the description and pedigree of "Scrivington," a very fine imported Cleveland Bay Stallion.

We hope every public spirited owner of a good Stallion, will be amply repaid for his efforts to improve the breeds of our horses, and that the time is not far distant when the "Old Dominion" may with truth and pride, assert her claim to the possession of the *finest* specimens, of every class of horses.

The Stallions now advertised in the Planter, are well worthy of the support and patronage of breeders.

Mr. Kettlewell.

☞ See the advertisement of Mr. Kettlewell, which is of sufficient interest (apart from its advertising intent) to make it worthy of perusal for the sake of entertainment. Mr. Kettlewell thinks that the present laws of Russia relating to the importation of Tobacco, to that country, will soon be so altered as to create a larger demand in that market for this crop. We hope this may be so, as we shall have a largely increased quantity of it for sale, in consequence of so many farmers turning their attention to it, who have hitherto, not attempted its production.

Oats.

The time for sowing having arrived, we devote a short space to the consideration of this crop. By many farmers, oats are considered greatly exhausting to land—much more so than any other article raised for provender. We do not agree with those entertaining such an opinion, but believe them less exhausting to land than wheat or corn—while as an article of food for stock, we believe they have no equal. They are easily digested, and hence cause no overweight and distention of the stomach. This is an important item in their favor, as food for horses of quick draft—rendering them less liable to founder, and loss of spirit, while on the road. Every good horse master knows, that his horse cannot travel well, with his belly filled up to its utmost capacity, with heavy food of any sort. His diet, when he is called on to go a lively gait, should be so regulated, as not to task the muscles of digestion and locomotion at the same time. Oats are considered best for securing this condition, by many horsemen. We believe they are. We have seen the opinion expressed—we do not now recollect where—that a good crop of oats on a farm, amounted to an insurance of the lives of the stock to be fed upon them, since they were thus rendered comparatively free from attacks of those diseases generated by disorders of the stomach and bowels—worms included.

Every farmer, therefore, should raise as many as he can, without over-cropping himself. Most persons, we think, would make better crops of them, if they would sow them *thinner*. It is no unusual thing to see from two to two and a half bushels sown to the acre in this vicinity. We have been told by an old, and unusually successful farmer, that "a bushel and a half of oats is enough to sow on any acre of land." In our own experience, we have observed that our crops, sowed *thickly*, promised well at first, and yielded badly at harvest. Oat blades branch a great deal, and require room for so doing. Thickly sowed crops, rarely branch at all—besides, the lower leaves almost invariably turn red, and the straw is short enough to cause much waste in harvesting.

We think it best to sow them as early in March, as may be practicable. We would say in February, if the weather and condition of the ground suited for plowing and seeding. We once tried the experiment of sowing a lot in February, and made a better crop from the piece of ground, than we received from the same quantity seeded in March.

A gentleman who formerly resided in this county, and who owned a poor farm, was famous for his good crops of oats. Upon being asked the secret of his success, replied, "I sow in February, and you in March." Oats are not as easily killed, as is generally supposed, by cold weather, if they are covered with a single plow, which is my method of putting them in.

Kossuth.

We call attention to the advertising sheet of the Planter, in which will be found Mr. H. J. Smith's card and challenge. We are glad that this fine stallion will stand the present season at his old stable. There is yet a sufficient demand for his services in the immediate vicinity of Richmond, to make it certain that he can be kept at home with profit to his owner.

We return our thanks to our friend Dr. Eustace for his information about the "Sweet Potato." In a future number we will give the analysis, which may be found in White's "Gardening for the South."

The Farmer and Planter—published at Columbia, South Carolina—R. M. Stokes, Editor. Price $1 a year, in advance.

This paper comes to us in a handsome new dress. Its contents are interesting to the friends of Agriculture, giving as it does a variety of able and valuable articles on husbandry. We hope Mr. Stokes will meet with success in his Editorial efforts, and by them find his position as Editor made both profitable and pleasant.

The former Editor in his retirement from the post which he has so long adorned, has our best wishes for the happiness which he has so well earned as a faithful servant of the agricultural public.

The Rural Annual and Horticultural Directory, for 1859. Published at Rochester, New York, by Joseph Harris. Price 25 cents.

We return our thanks to the publisher for a copy of this neat and valuable annual—illustrated with seventy-five engravings, and replete with instruction on Orchards, Gardens, Cattle, &c., &c.

We heartily commend it to the public.

Valk's New American Style of Architecture.

We return our thanks to L. B. Valk, Esq., Architect, 627 Broadway, New York, for a handsomely executed design of a cottage residence, which is neat, economical and finely finished. The design does credit to Mr. Valk's taste and skill in his profession. We shall be glad to witness an increasing attention to ornamenting and beautifying the country homes of our own State—especially, since we can procure for them, beauty without any sacrifice of comfort and proper economy.

The cost of Mr. V.'s design, is $2,200 complete.

Our Agents.

The following gentlemen have kindly consented to act as our agents, and are authorized to give receipts in our names for payments due the "Southern Planter," by either old or new subscribers:

Jno. W. Burke, Alexandria, Va.
Major P. Williams, Washington City, D. C.
Wm. F. Catlett, Guiney's Depot, Va.
Turner & Acree, Walkerton, K. & Q., Va.
John T. Childrey, Henrico.
James N. Goldsborough, Easton, Md.
Geo. C. Reid, Norfolk.
Benj. F. Gresham, Newtown, K. & Q., Va.
F. N. Watkins, (at the Farmers' Bank,) Farmville, Va.
Samuel Sands, Esq., Baltimore, Maryland.

For the So. Planter.

February 8th, 1859.

Mr. Editor—Will you please inform me through the Southern Planter how *Copperas* should be applied on land as a manure, and if any of your contributors, or yourself, know to what it can be most advantageously applied, and very much oblige,

Yours, very respectfully,
A Subscriber.

We have never used copperas in any other way, (as a manure) than by sprinkling a strong solution of it over manure heaps, for the purpose of "fixing" the ammonia contained in them. It is very beneficial also as a deodorizer or disinfectant, when applied in the same manner, over the floors of stables, privy vaults, hog pens, &c.

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For the Southern Planter.

Earth and its Herbs.

[*The spontaneous products of the earth considered in connection with the peculiar character and condition of the soils upon which they grow.*]

While endeavoring, in that small way to which the unlearned are restricted, to make some examinations into Agricultural Geology, I have, again and again, had my attention called to the long recognized fact of the connection between a soil and its flora.

We are assured by the great masters of science, that, from a view of the physiognomy of a district,—that is, from a view of its natural scenery, together with its vegetation, the skilful geologist is often prepared to arrive at a surprisingly accurate determination of its geology. Indeed, there can be but little doubt of the intimate connection between a soil and its vegetable productions,—the dependence, that is to say, of the latter, not only for vigor, but specific character, upon the former. But, when we ask if this relationship,—this dependence is of such a nature as to afford hopes that a closer investigation of its laws may lead to useful results?—we have a question before us involved in innumerable difficulties and obscurities. Here and there, bearing upon it, are facts so palpable as to impress us with the belief that they must be but single features of some great system of truths, that we have, in so far, gotten hold of: yet, when we enquire further, we meet with disappointments, perplexities, and seeming incongruities. May not these, however, arise chiefly from our want of knowledge? want of correct observation? want of sufficiently close scrutiny and examination? Other subjects appear to have been involved in as great, or even greater obscurity and confusion, which have, nevertheless, been brought within the cognizance of science, and found to be subject to, and under the influence of determinate laws. Indeed, we know that the whole universe is governed by such laws: a system of government, by the way, especially adapted to the condition of fallen intellectual creatures. Man is obliged to examine into, and avail himself of these laws for his temporal happiness and well-being.

As to the vegetable world, many of its laws are known: and some of them relating to the subject we are considering, are constantly made use of, although they are but very imperfectly and vaguely comprehended. Every experienced farmer, for instance, upon an examination of a field, readily forms an opinion,—and generally a substantially correct opinion,—of its character and adaptability to particular crops. Some time since, I met with my father's manager, upon a piece of ground which he was beginning to have fallowed for oats, and asked his opinion of it. He was wholly unacquainted with the field, having never seen it in cultivation. Crushing a newly made furrow with his foot, and casting his eye over the hill,—for this field lies upon a hill-side,—he pronounced it to be "good land, very good; coarse, but light and free: a good soil for oats and corn, and probably for tobacco, if manured." Now, I know that this opinion is correct. This hill presents a tolerably fair specimen of the lands of the *Guinea region*,—(a district somewhat noted for its enduring fertility.) The hill is made up of porphyritic granite; that is, granite with distinct crystals of feldspar. Its principal mineral ingredient is glassy feldspar. The soil is grey, coarse, light and free. There are a few loose fragments of hornblende, scattered over the summit of the hill, with crystals on their surfaces brilliant and distinct, the accompanying mineral, probably feldspar, having mouldered away. This field has not been in cultivation for a number of years, and its principal growth, especially abundant on the side of the hill, is mullein, crab-grass, running briers, cowhage and broom-straw, with some green-sward, this last no more plentiful than other plants not mentioned. I allude to this case, merely because it has recently come under my own observation, as an instance in which an experienced eye, by an examination of a soil and its vegetable products, was able to take in enough to give a correct idea of its value. But instances are not needed; for the farmer constantly recognizes this fact in his practice. With an observant eye, he marks the vegetable products of a field, and from the quantity and quality of these, makes an estimate of its fertility, and of its adaptability to particular crops.

Now, where the whole presents a truth, the parts must contain the elements of that truth. Where a broad view can thus lead to general deductions, which are substantially reliable, it is surely reasonable to entertain hopes that a closer scrutiny may lead to particular results; that a more intimate acquaintance with the facts from which these general deductions are drawn, may afford information of importance, both as to its character and extent; and that, especially in connection with the valuable, but somewhat vague and not sufficiently reliable hints afforded by geology and chemistry, a more comprehensive and definite knowledge of the indications given by the vegetable productions of a soil, as to its character and condition, may prove of great service.

But how is such knowledge, except on a very contracted scale, to be acquired? How are the various facts known to separate individuals, to be so concentrated and arranged, that the observations and experiences of one person, may be of profit to another? It is in regard to this question, and with the hope of calling attention to this highly interesting subject, that these remarks are made, and with no thought of conveying information; for, as to myself, I am not a farmer, and my observations have been confined to a narrow range, and are very limited; and this subject is one so broad in its reaches, and so environed with difficulties, that no single individual, whatever his opportunities for observation, could hope to compass it. One method, which seems to be possibly practicable, presents itself. If those who are interested in these enquiries will set themselves to gather up such facts, as may fall within their observation, and will make plain and circumstantial minutes of such facts, and communicate them to the *Editor of the Southern Planter*, (who is *ex-officio*, guardian to some extent of the agricultural interests of the State;) or to the distinguished *Chairman of the Executive Committee* of the Agricultural Society, (if that "noble and great-minded" man can be led to undertake the investigation:) such a ground-work may be laid out,—such a nucleus of well digested facts formed, as will ultimately lead to as full and perfect a development and arrangement as the subject will admit of.

We know that there are laws governing the vegetable world, upon which plants depend for their existence and vigor; we see that some of the more obvious of these have been observed; have been taken hold of and brought into service: but we have reason to believe that only the most obvious, and but few of these, and these only to a partial extent, have been as yet apprehended, and that a wide and as yet unexplored field, in connection with this subject, lies open before us; for I am not aware that it has ever, anywhere, met with due examination. In the first volume of the *Farmer's Register*, (page 702,) is an extract from the *Revue Encyclopedique* on the "*nature of earths with reference to the growth of plants*," which is as follows:

"The report of M. M. Thenard and Sylvester, in a memoir upon this subject, by M. J. St. Hillaire, is to the following purport. The author remarks that most persons who have analyzed arable earths, [soils,] have taken exclusively such as had been cultivated, and in which the original constitution had been more or less altered. He believes that the various kinds of earths, in their first state, have peculiar powers of nourishing particular plants; and thinks that the exact knowledge of these peculiarities would enable cultivators to put those seed in the ground which are most suited to it. From various analyses, he draws the following inferences: 1st. That all earths are composed of silica, alumina, lime, magnesia, &c., in different proportions, together with a vegeto-animal matter, which is more abundant as the earth is more fitted for the nourishment of plants. 2ndly. That plants placed in earths of which the constituent parts have an analogy with the particular nature of the plants, do not exhaust the soil. 3dly. That a series of observations on the different species, genera and families, which grow naturally and in great numbers, perpetuating themselves on certain soils, with the analyses of these soils, would be of great utility in agriculture. The reporters think that agriculture would draw from such labors general inductions, rather than positive directions, but still that these would possess great interest."

There are portions of this extract which appear to bear upon this subject. I presume that only *primitive* fresh lands, such lands as have never been cultivated, are included under what this author denominates "the first state." But whatever he may mean by this expression, I think it no less certain that the "peculiar powers of nourishing particular plants, which he attributes to this state, may with equal propriety, be attributed to the second, third, or any other state of soils: and further, that to every state of the soil, as well as to every kind of soil, there is a corresponding grade of vegetation. There are certain plants which will flourish and prevail during certain stages of a soil's fertility, which will not be found upon it during other stages: while there are some, which, owing to its peculiar chemical constitution, will never flourish upon it, unless this be changed. Of the inconceivable myriads of seeds which the weeds and grasses annually bear, and which, being in various ways scattered abroad, spring up all over the face of the earth, it is manifest that those only will be able to push their way among their competitors and grow luxuriantly, which find something in the soil upon which they are cast adapted to their particular requirements. Should a plant requiring for its healthy growth and condition, a plentiful supply of lime, for example, spring up in a soil where there is little or no lime, it would of necessity have to yield to such of its competitors as do not depend on a supply of this earth for their perfect development. There are certain plants which are never found except in particular localities. I have never seen hoarhound, catnip, or wormseed, (*chenopodium anthelminticum*,) growing far from the haunts of man and his dependents: and I think that melilot-clover, (*melolotus alba*, or white melilot,) only grows with any remarkable degree of luxuriance upon, or near the sites of old buildings; while many of our wild grasses and weeds are never, or rarely found in such localities. Broom-straw and hen-nest grass, for instance, are seldom, if ever seen disputing the ground with the four plants just mentioned.

But vegetables not only require the existence, or non-existence of certain chemical elements in a soil, but also demand certain *conditions of the soil*, for their healthy production; so that two soils may yield precisely similar analyses, whose natural productions would, nevertheless, be markedly different; in which cases, if we understood their peculiarities, the vegetable productions of soils would certainly afford the best means of ascertaining their capabilities and adaptabilities in reference to particular crops. A certain degree of porosity, lightness, or mellowness of the earth, is requisite to the healthful development of various plants. Thus, should a plant delighting in a loose, friable soil, germinate in earth very close and compact, it would certainly be surpassed, and would probably be quickly smothered by others to whose nature and wants such a soil is better adapted. Throughout this immediate region, and I know not to how great an extent of country this remark may apply; an autumn fallow, by which the soil is exposed to the mellowing influences of winter, is invariably followed by a heavy growth of ragwort upon all lands of a tolerable degree of fertility; while a spring fallow of the same lands will produce a much smaller cross of this weed. When the soil has become more close and compact, the ragwort is succeeded by a like heavy growth of stickwort. These circumstances point out the fact that such lands contain plentifully the chemical ingredients fitted for the support of both these weeds, and that the prevalence of either depends upon mere mechanical conditions; the same land, in one condition, abounding in one weed, which, in another condition, abounds in the other.

The fact that a parcel of ground is "drowned," that is, injured by too much moisture, is instantly apparent to any one, upon an inspection of its vegetation. And this is indicated by the presence of aquatic plants, or such as delight in and require much moisture; or by the unhealthy condition of other plants; or by both these means. There are certain varieties of grasses and weeds as well as shrubs, almost sure to be found on moist, springy lands, in which they flourish luxuriantly and vigorously, the sight of which, were all other objects excluded from the eye, would infallibly convey the impression of the propinquity of the water. Of these, again, there are some such as bulrushes, flags, etc., which not only require a considerable degree of moisture, but also seem to demand, though of this I do not speak positively, that the water should be in a measure stagnant. On the other hand, experience leads us to expect that spots peculiarly dry and devoid of moisture, will be clothed with a peculiar vegetation; certainly none of the aquatic plants will be found to flourish in such situations. Modern inquiry has led to much curious speculation in reference to the habits both of animals and plants, and the general truth has been arrived at, that these may be changed only to a certain extent; their powers of accommodating themselves to other circumstances and habits than those in which nature has fixed them, being limited. Plants, when considered only in reference to their connection with soils, climatal influences being passed by, possess these powers in very different degrees; some of them spreading themselves over a variety of soils; always, however, with some variableness as to vigor, perhaps, and subject to, and in dependence upon, certain creditors. An inquiry into the conditions upon which some of our more common weeds and grasses depend for their existence and vigorous growth, would prove very interesting.

In some regions, as the more mountainous, exposure exerts a very powerful influence upon the character of vegetation. Some plants delight in the shadows of a northern exposure. I have never met with monkshood, growing wild, save on steep northern hill-sides. My observations, however, have been confined to this particular region, the general inclination of which is to the north-east, and where the bluffs and escarpments, or sudden terminations of hills and the steeper declivities, for the most part, look to the north; and were, indeed, except upon such occasional bluffs, etc., too steep for cultivation, exposure appears but slightly to affect general vegetation, either as to character or vigor; for nothing is more common than to see our ordinary field-crops growing as luxuriantly upon northern exposures, as elsewhere.

The texture, that is the coarseness or fineness of a soil, depends upon its exposure or position and upon its geology, that is, upon the kind of rocks from which it is derived. It is noticeable as a general fact, that coarse soils are best adapted to coarse herbage.

Upon the whole, we may safely set down this fact, which our experienced farmer, while examining a field, as first above stated, has not failed to consider, though he may never have had it distinctly expressed before his mind, in so many words, viz.: That the vegetable productions of a soil truly indicate, not only its degree of fertility, but its chemical qualities and capabilities, and its mechanical conditions and peculiarities. What we need is skill rightly to interpret their indications.

A difficulty which, in the consideration of this subject, presents itself at the outset to our enquiries, arises from the effect of climatal influences: that is, from the apparent confusion and interminglement of the botanical provinces of various kinds of plants. But as a general fact it may be assumed, that the absence of one plant in any locality, may be supplied by another, or others, depending upon like causes and serving the same purposes.

Other difficulties spring from what appear to be anomalous freaks in the vegetable kingdom. Certain weeds, like the army worm, or the locusts of the East, occasionally overrun our lands for a time, then disappear and scarcely leave a representative behind. To what cause is their temporary prevalence to be attributed, and their sudden cessation? There is a parcel of sandy Appomattox flat land; the sand deep, and siliceous, but fine and lamellar; which, about eight years ago, was turned up with the double plough. A crop of corn was cultivated, and after the corn a crop of oats. With the oats appeared many thistles of the common variety, and during the ensuing season, and for several successive seasons, the land was literally covered with this weed. It has since been cultivated again in corn and oats and plowed as before, though not with the same results; for now, after two years of rest, except that it has been grazed closely, only a few thistles are left. Other weeds, the same which prevailed there before the first deep plowing, have again taken possession, the most noticeable of which are cowhage, red horse-mint and life-everlasting.

Among the difficulties which meet us in such enquiries, are those which arise from the interference of stock, of insects, severe winters, and the diseases of plants by which they are sometimes exterminated. These causes, one or more, may and constantly do promote the increase of one class of plants at the expense of others. Another difficulty comes from the different degrees of hardihood of various plants. A soil for example, may be suited to three different plants, but in different degrees: thus it may be better adapted to the first than to the second, and again better suited to the second than to the third; yet the second may be hardier than the first, and the third more hardy still, and this to such an extent as to enable it to contend successfully with the others. And to this cause, united with the depredations of animals, who alway prefer the tender and more delicate kinds, is to be attributed the fact that many of our lands abound almost exclusively with the hardier and more unsavory herbs, which are in reality better adapted to the growth of others. Another trouble, one common to all human enquiries, is found to proceed from our proneness to be misled by our peculiar *notions* into false conclusions; to have facts distorted, however earnest and honest we may be in our desire to arrive at the truth by some idiocratical vagary. But with all the difficulties which beset us, is it not highly probable, as was before suggested,—nay, is it not certain, that by a combination of effort—by a careful comparison and systematic arrangement of the observations of different individuals in this interesting field of enquiry, very much useful information might be acquired, and many highly valuable facts collected and brought into use? M.

For the Southern Planter.

The Horse.

The seasons for breeding this noble animal is at hand, which makes a few remarks on that subject pertinent. Since the extensive breeding of mules has commenced in the West, and the price of grain has ranged so high in the East, the price of horses and mules has gone up to an almost ruinous rate, especially when they are subjected to the abuse of negroes and overseers, who regard the killing of a mule and the crippling of a horse as small events, which a forgiving master ought not to talk about; all of which is so much money lost to the owner,—and more than that, their places must be supplied. If we go to raising mules, every mare we put exclusive to the rearing of that animal, is as respects any other breeding purposes, as if she were gelded; and the stock ceases, in as much as the hybrid progeny are incapable of reproduction, and with them, therefore, ends the race.

That something must be done to increase the stock of horses is evident. In this section of Virginia, it is next to impossible to purchase a good horse raised among us. Not because we cannot raise fine horses, but because the few raised are for private use alone, and when good, cannot be bought unless we pay a very large price; and in some cases, even the offer of a large price often fails to get the horse. Consequently the Richmond horse and mule traders grow rich by selling us their stock, which we are obliged to have.

As a remedy for the evil, each farmer must keep one or more good mares, and breed his own stock, of this as of other kinds of animals. When the mares become old, or get injured, then breed mules from them; but always allow the mare to breed a few horse colts first, so as to keep up the stock.

Mules are only *necessary* for the most rough and injurious work; horses and oxen suit best for other kinds. In fact, a well-appointed farm requires horses, mules, and oxen. A farmer who purchased all his oxen, would be thought a bad manager; so ought a man who has to purchase his horses. Mules may be bought, but where farmers are so circumstanced as to raise them advantageously, they should do so. The introduction of the mule and ox into an essay on the horse, is unavoidable. They are naturally related, and all co-labourers and essentials in plantation service, and are thus necessarily brought in.

To return to the horse. Which are the best stocks to breed from, and what the best modes of raising? On these two points, many and various are the opinions entertained and expressed. For the section from which I write, the blood-horse stands first. For all elegant and ornamental purposes he is pre-eminent, and as a farm animal, in good hands, is equal to a mule. The blood-horse is almost universally bred in *this* entire section. So long have they been considered the animal for us, that the stock, in many instances, is becoming too delicate, and has, indeed, already grown so. They have not neck and shoulder sufficient for heavy work. This defect may be overcome by breeding on the Morgan and coach-horse stocks, so as to grow animals with more fore-hand, as the blood-horse is apt to be "light in front." For myself, I esteem the coach-horse as the best cross. He has more crest, more barrel, than the Morgan, which has a *pony* tendency, and in age falls down: as is evident from the want of withers. The neck of the Morgan rises, as it were, from his back. Moreover, he is of a Northern race of animals, and his coat of hair and his blood are too thick, his barrel too round, and his ribs too short. He does not "blow out" long enough. Also he has too much crest, which, in hot weather and in rapid action, would produce vertigo. Yet a judicious crossing of this stock on our "nags," or native stock, gives a "smart horse." The few opportunities offered us for crossing on the Cleveland Bay, have been successful,—and some fine horses of that stock crossed with the thoroughbred are to be seen amongst us. The number as yet, however, is quite limited. In the "Piedmont" section, they are becoming quite numerous.

Our most popular stocks just now, are the descendants of Boston, Imported Trustee, and the Boulware Arabian (shaheen.) These are crossed on the descendants of Diomede, Ratler, Gohanna, Tom Taugh, &c., and are used alike for the saddle, the carriage and the plow. The *legs* and the *loins* are the requisites for our soft soil. Where *they* are right in these particulars the horse is apt to be a good one, though, as mentioned above, the shoulder is deficient and the neck too small.

Gentlemen would do well in breeding, not to keep more brood mares than they can keep well, and never to breed horses from one defective in the eyes or feet; (such should breed mules.) A stock of horses that is remarkable for gentleness is best, provided this gentleness does not arise from indifference. Although any animals taken in time and properly handled, will work,—which means, when they are *weaned*, have them haltered and gentled, and every winter of their lives (when they are obliged to be sheltered) have this process of handling and gentling kept up, so that when mature the colt is broken,—or, in other words, his education is complete.

The ordinary mode of colt-breaking, is breaking in earnest. A strong, healthy, vigorous colt is put into the hands of a large negro to break. He and a sand-bag, and afterwards a road-wagon, are the implements of torture; having gone through which he is generally injured, dulled for life, and considered a thoroughly broken animal.

After the breaking, comes the shoeing, one of which methods is, to cut off as much of the frog as possible, trim out the sole of the foot, drive the nails as high as possible, then gash in and rasp down the hoof, until a "neat job" is "turned off," and the horse sent home as being "well shod." All of which I dissent from. If the frog was of no use, nature would not have put it under the foot of the horse. If the sole should be thin, nature would not have made it thick, and as the lower part of the hoof is thick and the upper part thin, the lower part is the one for the nails to be driven through and clinched *on*, not *in*, as is the case when the hoof is gashed by the rasp.

The best mode of shoeing is, *never to touch the frog* with shoe or knife. Put on a wide shoe, fitted smoothly to the *outer rim* of the foot, leaving the sole untouched. Then drive through the nails, so that they come out three quarters of an inch from the ground, clinch them down on the *smooth* hoof, then brush the rasp over parallel with the hoof; and, finally, rasp around the extreme lower edge of the hoof, so as to make all even with the shoe. In doing this, as little of the *rim* of the hoof should be pared as possible. The shoe should not remain on more than from six weeks to two months,—and a few days interval should be allowed between that and the reshoeing.

During the winter and spring, horses should go without shoes as much as possible. The earth is then wet, and the hoof toughens. The summer is unfavourable; the earth is dry, and the numerous flies and insects occasion a great deal of stamping, which breaks the hoof.

Horses which are shod as above indicated, are not apt to have either narrow heels or corns, or any of the numerous diseases the horse is subject to from bad shoeing. Most blacksmiths will tell you they "won't turn their backs on any one when a horse is to be shod." Still they will lame your horse. Some are very much offended at your presuming to have your own horse shod except as *they* choose. Never mind that: they expect *you* to pay as they choose. Well, if you do that, have the work done as *you* choose—which is nothing but fair.

The bearing-rein is a source of injury also. I do not advocate an entire abolition of the bearing-rein, except on very elegant forehanded horses, but do advocate a very *gentle* use of it; just enough to keep the animal from lounging his head about, and from browsing. Many who have animals with light thin necks, and small heads, which would of themselves carry heads up enough—run them up until the plane of their fall is almost horizontal, and the sun shines perpendicularly on their brain. This they consider stylish, and pronounce an animal whose tail is cut off and turned up, foretop cut out, and head thrown back, until he is the reverse of nature, a "showy, commanding" animal. Whenever I see a horse with his tail off, I feel assured he was an ungainly animal thus "put up" to get a sale. The only use for the knife with a horse is to *geld*, which is best from one to two years old, though, it may be done until almost any age, with care. Two gives more cost than one; at three sometimes they become spiteful, though it is a safe age.

When the colt is thoroughly mature, he will render much service if raised and broken with care and judgment. There is scarcely any work that, in skilful hands, he will not perform. The most fretful should be kept for light, quick work; and most patient for that which is heavy and tedious. To have good, easy running wagons and carts, and not allow them to be overloaded, which is a gain for a few hours or days, and then the animals cannot do as much as was natural, and frequently none at all, being permanently injured. By working them to easy running vehicles, with good harness and a sensible driver, one's riding horse may be worked without injury, and sometimes with decided benefit.

All negroes will rein up horses to an absurd height, merely because they admire what is ridiculous, and prefer what is wrong. The master, therefore, should keep an eye to these things, so as to correct all such improprieties as the one above referred to, the excessive use of the whip, bad fitting collars, short backbands, traces so short that the swingle tree bruises the hocks, &c. When the horse comes in from use, have a small lot for him to be turned in, to wallow and rub for a few moments, when he will return to the stable of himself. This will keep him from rubbing when under the saddle or in harness, and from laying down when tied out. A roomy, clean stall and good bed of straw, add much to his comfort. These may appear small matters to write about, but in reality are of moment. Some *good* farmers say, they have not the "horse bump." Well! considering the *bumps* we give the horse, it is well to have such a talent. Farmers who have no talent for horses, and overseers who have none, should make a study of them, as of any other branch of agriculture. In fact, I will keep no man in my employment who *can't* keep a fat team. You had as well employ a man who could not cultivate your crop, as one who cannot keep the *means* of cultivating it in a condition to work.

The *bit* is another thing requiring attention. For the bridle to be worked so short as to draw the mouth up, or the check-rein to be so drawn as to saw the mouth, and cut it back or sidewards larger than the natural size, is a thing no horse ever recovers from. The saliva is always oozing out; he can't drink with ease; his lips hang,—and altogether, the horse is a deformity. I have seen careful, attentive farmers, with horses over twenty years old, which they raised themselves, that were still efficient animals.

The attempt of farmers to raise race horses, unless they are men of wealth, is injudicious; but I certainly hold the raising of the horse as essential as that of any other domestic animal, and recommend all farmers to attend to them. Where the matter is understood, the raising of horses is not as expensive as is believed. The cost and trouble are inconsiderable, in comparison to their benefit. What we are paid in dollars and cents is not half of the profit of this animal. In all the phases of life we see the horse the help and companion of man. "In peace and in war, he is first in the hearts of his countrymen." In pleasure and in pain we want him; in wealth and in poverty we use him. The first thing which strikes our boyish fancy, before our hearts are attuned to love, is the horse. When in love, our first want is, like "Lord Marmion," to be mounted on a "prancing roan;" and after death the horse pulls us to our grave—or, in other words, "when some proud son of man returns to earth," the neighing of steeds and tramp of men always are among the requiem for the dead. And, indeed, if "Stern" is to be believed, *before our births, horses are sometimes in demand.* So, raise the horse.

TIDE-WATER FARMER.

For the Southern Planter.

Peabody Corn.

ISLE OF WIGHT County,
Jan. 24th, 1859.

EDITORS SO. PLANTER:

Gentlemen.—For a month or two past. I have been on the eve of writing you, to give you the particulars, culture, and yield of a small ear of Peabody's Prolific Corn, presented to me by one of you last winter in your office, from a stalk of corn sent to you by Charles A. Peabody, Esq., of Georgia.

After receiving that ear from you, I became anxious to obtain a little more of it; so I wrote on immediately to Mr. Peabody, enclosing him two dollars, and soon received by mail about three gils of his, the same variety of corn.

At the proper time, say about the 25th of April, in an off field, which had been in cultivation yearly for many years, I had a small plat of land, sufficient to plant this corn, fallowed up with a single-turn plow, then streaked off four and a half feet, and ridged up, crossed deep four feet across the ridges; one table-spoonful of Peruvian Guano applied to each hill, a little dirt thrown over the Guano, and one grain of corn dropped in the check over the Guano, and covered lightly, (1709 hills in all.)

It came up finely, but the Guano being too near the grain of corn in the hill, I suppose, caused several hills to wither and dry up. The birds and moles, too, came in for their share, and finally, I only had 1306 bearing or standing hills. I replanted the missing hills afterwards, first in peanuts, then in black peas.

In good time I had this corn plowed and hoed; and in time, again, I had it plowed, (growing finely;) and I intended to have plowed and hilled up early, but, alas! alas!! the drought, such as I never before have seen since I have been farming these twenty-eight years, came upon us, and for some time I waited and waited, until I finally concluded it would make nothing as it was, and it could do no more if I worked it and the drought should continue. I therefore had it plowed and hilled up. I did not go in it for some time, thinking I should get nothing from this trial, as crops of corn were considered cut short nearly one half.

Well, about gathering corn time, as I was about to leave home for the day, I thought of this corn, so I directed one of my men to go over to the field, pull it down, take a cart and haul it home,—observing to him that I reckoned he could bring it in the cart at one load. On reaching home at night, I asked my man, "What success?" and he stated that he had hauled up four good loads of this corn, instead of one, as I thought.

Next morning it was nicely shucked out, and I made some little over four barrels of good nice white corn.

Now, Messrs. Editors, in consideration of the excessive drought, and only common culture, and about eighty pounds of Guano in the whole plat of land, and the pea hills receiving 403 spoonfuls of Guano out of the eighty pounds, I do regard this as an excellent yield, indeed. The product of corn in a very dry season indeed, on common land, being five bushels for each 325 hills!

This corn resembles our common variety of white corn in looks, but in growing, soon after being up, shoots out suckers, or tillers, near or at the ground, as many as three, I have seen, to the stalk, each of which grows up luxuriantly with the parent stalk, and all are very prolific in their bearing, the ears are of a medium size and of the usual lengths. from twelve to sixteen rows; and I speak within bounds when I say it will yield fifty per cent. more corn to the hill than our common variety will; and it is not of the sleek variety of corn either.

So well pleased am I with it, that I shall plant several acres in this corn the present year,—away from any other corn, that it may not mix with my other common corn.

I am in hopes (seasons suiting) to let you hear a good account of my better success next fall; for I do think I can raise fifteen or eighteen barrels of this corn per acre, from improved lands as well as Mr. Peabody, whose crop per acre was ninety-two and one-fourth bushels of shelled corn, and twenty-five acres in cultivation, as will be seen in his circular. My lands are poor, but there is nothing like TRYING.

Excuse me for this lengthy note, as I had not designed being so lengthy when I set down to write. Probably you may be able to find a corner in your paper where you can dispose of this without much inconvenience.

Yours truly,

A. G. Moody.

For the Southern Planter.

Fish as Manure for Corn.

Wicomico Church Va.,
February 19th, 1859.

In answer to the request that some subscriber who has had experience in using fish as a manure would give his mode of using them, I will say, that in this part of the county of Northumberland we have used fish for several years, and by some of the farmers living immediately on the water, very extensively. Our usual plan when caught in the fall, is to run off a furrow, and drop the fish (alewife is the kind we use, which is about the size of herring,) about one foot apart, and lap the land over them by throwing two furrows; and let it remain until spring for corn.

When we use them for wheat, we drop and cover in the same way, only have the rows about two feet apart. The oil from the fish will extend entirely over that surface. When we use them in spring for corn, we drop in a furrow about a foot from the corn, sometimes in the middle of the row; in this way the corn receives no benefit until it gets large. We never catch them until our corn is planted.

Had I the fish now as Mr. Graves has, and could keep the dogs from pulling up the corn, I would drop and bed on them as in the fall.

Very respectfully,

E. Brown.

From the Maine Farmer.

Board of Agriculture.

EVENING CHAT.

Tuesday, January 26th.

The subject for consideration was "*Stock of all kinds.*"

Dr. True, of Oxford, said, I wish to occupy but a few moments; but I wish to put in a plea for our "natives." I think justice has not been done their merits by our breeders of fancy stock. I stand here to challenge all the growers of improved breeds to produce anything equal to our good old natives for milk. Where is any of your improved foreign stock, among which are found cows that will give milk the year round? Can you produce a cow that will give from thirty-five to forty-two pounds of milk per day? If you can I would like to see her.

And then, in regard to oxen—what is there equal to our old natives? You may get larger animals; but are they capable of doing the amount of work that our natives are? Are they as powerful for their inches, as hard and tough, and as capable of endurance? Most splendid stock is produced from our natives, by those who take good care of their animals. I would like to have our fancy breeders produce stock equal to some of those I have seen. I would submit whether the introduction of improved stock has not been a curse to this country, instead of a blessing.

Mr. Flint, of West Somerset, said, I have seen a full display of our native stock before to-day, and I must say, I do not think the introduction of improved stock has been a curse to this country, notwithstanding the wretched manner of breeding. Look at the facts. It is within my recollection that it was hard work to get a yoke of oxen that would girt six feet and four inches—harder than it is now to get those which will girt eight feet and six inches. Look at the stock exhibited at our shows, and what a change has been effected! Two years old stock, formerly, was not so large as our calves now are.

I have lately seen an exhibition of the genuine old native stock. Some speculators from my neighborhood went to Canada this fall and bought a drove of genuine natives, and the herd looked more like a herd of goats than neat stock. And the oxen ought to have been seen by my friend from Oxford, to have ample justice done them.

Thursday, January 27th.

The subject for discussion was the renewal of the debate on "*stock of all kinds,*" which was broken off on Tuesday evening to give place to the business of the Maine State Society.

Mr. Flint, of West Somerset said, I do not propose to discuss stock of all kinds. I am sometimes called "sheepish," as my friend here at my left is called "piggish." Not that we are particularly distinguished for the qualities these terms are sometimes used to indicate, but on account of the attention we give to these kinds of stock. It is true, I am particularly interested in sheep. They are my favorite stock. But I cannot do so much in this line as I would like, for the want of more pasture.

I am a little disposed to find fault with the action of the State Society in relation to this kind of stock. The premiums offered on stock is altogether disproportionate to the relative value of each. One hundred and forty-odd dollars are offered on premiums in Ayrshires alone, and only forty dollars on sheep of all kinds. This does not seem to be equal. As for Ayreshires, I never saw one in my life, and know nothing as to their value, relative or otherwise; but the value of sheep I do understand something about, and I regard these as the most profitable stock we can raise. I think sheep husbandry needs and deserves to be encouraged.

The fact is, as every one knows who is at all conversant with the subject, we do not raise wool enough to supply our home demand. We produce only about *one-third* of what we consume. There has been a decline in production in New England, for a series of years, till within a few years. We are now gaining, and this branch of husbandry needs to be encouraged, on account of the discouragements to which it is subjected. It is subject to more sudden depressions and fluctuations than any other description of stock, and hence farmers are more disposed to abandon it, as so many have done. But with all its fluctuations, I think, take a series of years together, no description of stock is so profitable as sheep, and no branch of farming so profitable as sheep-husbandry.

Perhaps I am not so good a judge in this matter as some others; for my experience has not been so varied. I was not bred a farmer from a boy, as some others have been. I entered into it, after attaining my majority, from choice. Farming is my chosen profession, and I chose sheep-husbandry as my leading business, and have always stuck to it, so that my experience in other departments is very limited, and my judgment is made up mostly from a complication of my neighbors and my own results.

To enable you to form a judgment as to the profitableness of this branch of this farming, I will give a statement from my books, of my last year's operations. The following are the facts and results:

Jan. 1, 1857.	Dr.	
To 250 sheep, $4 per head,	$1000	
To 45 tons of hay, $8 per ton,	360	
To 40 bushels of provender,	15	
To use of pastures,	25	
To shearing, twine, salt, &c.,	30	
		$1430
Sheep.—Jan. 1. 1858, (same time,)	Cr.	
By wool sold, 1000 pounds,	$470	
By lambs sold,	90	
By store sheep to Brown and Morse,	73	
By grade French buck sold,	120	
By Spanish bucks sold,	375	
By use of buck on hire,	50	
By mutton, sheep and pelts,	14	
	$1192	
Flock now worth,	1000	
		2192
Nett profit,		$762

Now I would like to see the farmer who can produce any other stock that pays as well as this. The fleeces brought almost two dollars a head. But this is not only a profitable business for the farmer, but it is an important interest to the country. Still I would not make sheep-husbandry an exclusive interest; but I think men having farms adapted to this branch of business, would find their interests promoted by making it a leading thing and all else subordinate. In most cases I think it best to grow different kinds of stock. But horses I dislike. I dislike them so much that I can almost any time go out of my way to kick a horse. They are only a bill of expense. There is no profit in raising them, They are of too little real value, to be esteemed as highly as they are. Too many are kept and too many are raised. They eat themselves up three or four times before they are old enough to be of any service. I think the most of them had better be knocked in the head, and the hay they would eat fed to sheep, when it will pay.

I know there is a great deal of fluctuation in the price of wool; but experience fully demonstrates that depression below the remunerative profit does not continue longer than from two to four years. Wool does not lose in value from age, and of course, when the price is down there is no necessity for selling. Four years is the longest it has ever had to be kept, before prices become remunerative. Usually it has to be kept only one or two years. I have never sold at a loss. When the price is down, I pack my clip in sacks and pack it away in a suitable place, and there let it remain until prices comes up to the remunerative point.

I feed my sheep in racks prepared for them. I give them but little provender—only waste beans, peas and oats. This I think better than corn. I let them have free access to good shelter and a plenty of water. I lose only about four per cent. of my flock in a year from all causes. More of these I lose in the summer than in the winter. A part of this is in the disappearance occasionally, from my pasture, of a good fat sheep, that goes, one can hardly say how or where.

I use my sheep manure in the spring. I usually plough up about five acres every fall, of grass land. I aim to turn up an inch of the subsoil that has never before been disturbed by the plough. In the spring I spread on from eight to ten cart loads of sheep manure to the acre, before the snow goes off. After the snow goes off I knock the lumps in pieces and scatter them over the ground. When the frost is out, I plough it in with a small plough or work it in with an ox-cultivator, without disturbing the turf. I then manure in the hill with a compost, and cover it with a hoe. In this way I get the best crop of corn.

Mr. Tucker, of Waldo, said, the gentleman last up seems to think that the building of railroads has reduced the price of horses, and made them almost worthless. The directly reverse of this is the fact, as I believe. Prices have never ruled so high, as since the construction of lines of railroads. On every line of railroad in New England, more horses are owned and raised, than in old stage times. In every little village is a livery stable containing more horses than the stage line which supplied it with the mails, and when such a thing as such a stable was never dreamed of. Beside there are quite as many horses owned among its citizens as before the construction of the railroad. It is true that a better class of horses is demanded, and those who breed miserable animals realize miserable profit, if they do not find it impossible to sell at any price. I confess I like a good horse, and my experience is, that a good profit can be and is realized on raising good horses.

Dr. Dill, of Franklin, said, I have no knowledge of the breeding of sheep and horses; but I have had some experience in raising neat stock. I know neat stock can be raised at a profit, even at present prices. I will give some figures to illustrate this, from my own experience.

In the fall of 1856, I took a pair of two year old steers on a poor debt, at fifty dollars. My account stands in this wise:—

Cost of steers	$50 00
Keeping one year I paid	16 00
Cost of steers the next fall,	$66 00

Could have sold them for $90 00, but preferred to keep them another year. Had I sold them they would have afforded me a profit of twenty-four dollars for the year's risk and interest, which is a pretty fair per centage on the investment. A business of this character is better than money invested in stocks or merchandize. And this is only one of many instances in my experience, that I might name; for I have tried it on stock of different ages—calves, yearlings, two and three year olds, all with the same general results.

There was a widow in my neighborhood who had a farm worth $550. This was the price for which it would sell. She was offered this sum for it, but I advised her not to sell; but to lease it for one-half the products, and occupy the house herself. She followed the advice, and the result was as follows, for her share of the produce:

8 tons of hay, $6	$48 00
20 bush. corn, $1	20 00
20 " oats and peas, 50c.,	10 00
30 " potatoes, 33⅓c.	10 00
Sold apples to the amount of	10 00
Received for pasturing stock,	16 00
Miscellaneous receipts,	20 00
Whole income,	$134 00

This is an income of 26 per cent., beside which she had the benefit of pasturing for a cow, the income of a small garden, poultry, bees and other small items.

These facts demonstrate, that both stock raising and general farming can be made profitable. How much better was it for this woman to keep her farm and cultivate it with other hands, than to have sold it and invested the money at interest.

Mr. Thissell, of Penobscot. I would ask if any one can attend exclusively to sheep raising, raising of horses, or any one kind of stock or crops, with the highest pecuniary results. My opinion is, that the better way is, for each farmer to attend to all the varieties of farming and stock raising. Then, if one fails, another may be successful, and thus compensate him for his losses. I think the true policy is to encourage every species of farming and every kind of improved stock. In this way we may be able to determine ultimately what description is best adapted to different localities.

Mr. Martin, of Androscoggin, said, I have listened with great pleasure to the remarks that have been made on the subject of stock raising, and particularly of sheep husbandry, which I conceive to be a great and growing interest. But there is one interest that has not been attended to, to which I wish to call attention. I mean of pork. I wish to do this, because it may be said by men who listen to what is here said or who may read this report of our sayings or doings: "Oh, this is all very well for men who have capital. If we only had the money to begin with, we could do something at farming; but as we are poor we cannot succeed."

I know something of the embarrassments which the poor man feels; the many and restless hours of the night-watches he spends in looking his embarrassments in the face, and devising how he may better his condition. I know there is many a man, honest but poor, in the present depression of business, who asks himself in agony and tears, what shall I set myself about, not to obtain riches, but to obtain a livelihood for myself and little ones?

My deep sympathy for such men, leads me to desire to suggest something and to do something for their encouragement and help. I began as a farmer, with a wife and child, and involved in debt in consequence of engaging in the lumbering business and lending my name as security for others. I have succeeded by my farming, in paying my debts, and at the same time have enjoyed farming and secured its delights and its rewards. My own experience makes me wish that every poor man could be encouraged to engage in and faithfully follow this pursuit, for it is the surest pay of any employment in which man can engage.

My plan of operations to start a poor man in business, is this: I would furnish him a capital of sixty-dollars. If he has need of such aid, let his friends and neighbors loan him that amount. Having obtained the funds, let them be invested in eight pigs, and the balance in corn. Let him put his pigs in a yard with a roof of poles, scantlings or other cheap material over it, and thatch it, to keep it dry. Let him spread over the yard a coating of a few inches in depth, of muck, loam, scrapings from the road or the chip-yard, and let an additional supply be added every week. Here let the pigs be fed with meal from his corn, till it is all consumed. Let him then kill one of the pigs, and with it purchase more corn with which to feed the remaining seven, till it is consumed, when he shall kill another pig and put it into corn; and so on till but four shall remain, which, if they have done at all well, will make, after eating up the fourth one, one thousand pounds of pork, and manure sufficient to manure one acre of corn in the best manner. This pork will pay for for his capital, and the interest and expenses, and leave him a small margin in cash, beside his manure which will amply compensate him for all his trouble. This manure will give him corn enough to commence the same business another year; and he can go on, increasing his profits and adding to his means. This experiment I have tried, and so have others, and all have been successful.

Mr. Leadbetter, of Somerset, said that he was a friend of the horse, and he thought that too many horses of poor quality were kept. What we most need, since men will keep and love horses, is, that they be good horses. In answer to a question, he said that generally it takes about three colts to get one good horse, according to his observation, although his own personal experience was more favorable, having come early into a good breed of horses.

Mr. Anderson of Cumberland, thought that take the pastures in the State as they are, and the short summer the Devons were the best. He allowed to Durham short horn cattle superior size and early maturity, but they are soft hoofed, loosely made, silky but thin haired compared with many other breeds; in fact, he believed them to be as tender as any breed except the Jerseys. To the Hereford he allowed superior size and perfect integrity of action.

If we can find a breed of cows of fair qualities, which will impart these to their offspring, we do the best. The Devons do this more uniformly than others. The Herefords require a higher growth of feed than the Devons, and are not so good milkers.

The introduction of the Durham breed into Maine he could not regard favorably. They were large and occasionally good milkers, but they cannot be relied upon for their integrity in imparting good milking qualities to their offspring. There is a great want of uniformity in this respect. Every farmer must adapt his breed to the condition of his locality.

An axiom of breeding is received in England, and prevails among the more intelligent breeders in the United States, that in stocking a farm with neat stock, regard should be had to the breed of cattle which had been native to the place; for if this principle was not regarded, the stock, if too large, would inevitably come back to that size, and on the other hand, those too small would increase in size until they came up to the size of the natives, and there is this advantage accruing to those which are too small that they increase, particularly in muscle, while those too large decrease in muscle and retain their large bones, and after this decrease their ungainly, disproportioned joints.

Mr. Goodale of Saco, spoke of the various breeds which he had noticed in his visits to New Brunswick and various parts of the State. There is everywhere an increased attention to this subject of the breed of cattle, and a great improvement is going on.

He referred to one matter which may by and by come to be of great importance when we send to market much larger number of cattle than we have been doing in the past, and that is the fact, suggested by chemistry, that in producing a pound of fat meat, there is less exhaustion to the soil than in producing a pound of lean meat. Fat meat does not draw the phosphates from the soil in the same proportion as lean meat, and yet lean meat sells for less than fat meat.

He called the attention of the Board to the importance of veterinary science. In Scotland the death by diseases in cattle had diminished one half since the introduction of this science into that country.—*Maine Farmer*.

A Short Account of Short-Horned Cattle.

As it may prove interesting to some of those into whose hands this catalogue may fall, and can scarcely be out of place, I will venture to give a short account of Short-Horned Cattle, confining myself to those authorities who are considered most reliable, treating the subject in as short a space as possible.

Youatt, who quotes from the Rev. H. Berry, is the chief author usually referred to on the subject of this far-famed breed of cattle, which some are disposed to divide into two varieties, on account of their different properties—the one more profitable for the dairy, yielding a large quantity of milk and butter; the other, which they call "the improved Short-Horns," peculiarly adapted to grazing and feeding. The Yorkshire cow, so popular with all dairy-men, both in the north of England and London, may be said to represent one variety; the animals carrying off all the prizes at the great agricultural shows represent the other. How far the two varieties may differ from one another, I have not space here fully to discuss. I am disposed, however, to believe that the transition from the one to the other variety may be made by following a proper system of crossing and treatment, or that the produce of the Yorkshire cow, might, by a few judicious crosses and proper management, be brought to represent the improved Short-Horn, and that the latter, with no better treatment than is usually given to the Yorkshire cow, and due attention to the milking properties, might, after a few generations, be readily taken for her more humble relative.

Yorkshire and Durhamare, without doubt, the native counties of the Short-Horns—the country along the banks of the Tees (which river divides these two counties) being at a very early period, noted for its cattle.

Whether the stock throughout that district was, in the first instance, improved by attention to the native breed of animals, by crossing the best cows with the best bulls, or by crossing with other stock, is a question which has not been settled beyond a doubt; it seems, however, to be the opinion of those best acquainted with the subject, that an improvement was brought about by the introduction of some animals from Holland by Sir William St. Quintain, of Scampston, Yorkshire, which were crossed with the native breed, causing the first great improvement, prior to that made by Mr. C. Colling, who brought Short Horn to a very high state of improvement, if not to perfection, as some would have us believe.

Proceeding on the principle that perfect symmetry is most rarely found in large animals, and that this was a great object to be obtained by a breeder, since in it you have one of the best proofs of thrift, early maturity, and fattening qualities, Mr. Charles Colling seems to have determined upon reducing somewhat the size of his animals, giving special attention, at the same time, to shape and quality; with this view he is said to have used the bull Hubback, calved in the year 1777; also, to have tried a cross with a Galloway cow. Hubback, though only used for a short time, seems to have been of much service. How far the cross with the Galloway advanced his object, is not so easy to say. The grand-dam of Bolingbroke being one-quarter Galloway, is the only bull of this blood known to have been used. By crossing him upon his old cow, Phœnix, Mr. Colling had Lady, which, from the prices realized at his sale, must have been, herself, a fine animal as well as a good breeder. It must be remembered, however, that Phœnix was the dam of Favourite, as well as Lady, and the excellence of the blood on that side being undoubted. Mr. Youatt says, "as the grandson of Bolingbroke is not known to have been the sire of any other fine animals, it is most probable that the unquestionable merits of Lady and her descendants are to be attributed more to her dam than to her sire."

The value put upon Mr. C. Colling's improvement by the breeders of his own time, may be estimated from the statement (given in Youatt's book) of his sale in 1810, where we find that

17 cows sold for	£2802	9. av'age,	£164	17	0
11 bulls sold for	£2361	9. av'age,	£214	13	6
7 heifers sold for	£ 942	18. av'age,	£134	8	3
5 heifer calves sold for	£ 321	6. av'age,	£ 64	5	2
47 produced	£7115	17. av. pr. hd..	£151	8	0

Which, reduced to U. S. currency, will equal about $732 75 per head.

Though Mr. Charles Colling has more reputation than any other breeder of Short Horns, his brother, Robert Colling, Messrs. Charge, Coats, Mason, Maynard, and many others, were at the same time breeding with success, as a statement of the prices obtained at some of their sales might prove; for, though not so high as those obtained at Mr. C. Colling's sale, it must be borne in mind that the first took place when every thing was high, the last during times of depression. At Mr. R. Colling's sale, in 1818:

34 cows sold for	£4348	3. av'ge.	£127	17	8
17 heifers sold for	1351	7. av'ge,	79	9	9
6 bulls sold for	1410	3. av'ge,	235	0	6
4 bull calves sold for	748	13. av'ge,	187	3	3
61 head sold for	£7894	4. av'g. per head	£129	10	10

Which will make about $613 per head.

The value of Mr. C. Colling's improvement being made public by the eagerness with which other breeders sought to obtain some of his stock, tended to diffuse his blood throughout all the cattle breeding districts, and though, during times of depression amongst those engaged in agricultural pursuits, this stock, like everything else, was much neglected, there were, fortunately, always men of spirit and means sufficiently interested in them to keep them up in their purity. Amongst these may be mentioned some of the immediate successors of Mr. C. Colling—such as Lord Althrop, (the late Earl Spencer,) Messrs. Bates, Booth, Maynard, Whitaker, and many others—and there can be no doubt but that the stock handed down to us by these eminent breeders is fully equal to any which preceded them. As there is no better way of judging of the value put upon anything by the public than by ascertaining what they will give *for it at public sale,* I will only say, that at the sale of the late Earl Spencer, the average of the whole herd, little and big, male and female, was about £68, equal to about $330 per head. At the sale of the stock of the late Mr. Bates, which took place 9th May, 1850, the average was somewhat less. Mr. Bates had six different families of cows—1st, the Duchesses; 2d, the Oxfords; 3d, the Waterloos; 4th, the Cambridge Roses; 5th, the Wild Eyes; 6th, the Foggathorpes.

Duch's av.,	m.&f.,	£116 5 0	pr hd	eq ab	$562 50
Oxf'ds,	" "	68 16 4	"	"	333 00
Wat'ls,	" "	59 10 0	"	"	288 00
C. R's.,	" "	49 0 0	"	"	237 25
W. Ey's,	" "	48 2 7½	"	"	233 00
Fogg's,	" "	46 19 0	"	"	227 25
Gen. av.	- - - -	67 0 7,	eq'l to ab't		324 50

I have taken notice of these sales for the purpose of showing the estimation in which Short Horns continue to be held; with this view, I shall notice that of the late Lord Ducie, which took place on the 24th August, 1853, and a few others.

At Lord Ducie's sale, there was sold:

49 co's, he'fs & ca's, f'r	£6,867 0 0	e. to	$33,236 25
13 bu's & bu. ca'vs, for	2,494 16 0	"	12,071 00
62 head in all, - - -	9,361 16 0	"	45,307 25
Average, per head, - -	150 19 0	"	730 55

It will be seen that the average price obtained at this sale is within a few shillings of the average obtained at Mr. C. Colling's sale, which considering the number of well bred Short Horns throughout Great Britain at the time, was somewhat astonishing. Lord Ducie had indeed taken much pains to select his stock, and was never prevented by the cost from having what he wished; nevertheless, the prices realized were extraordinary, and could not have been obtained but for the strong competition for Bate's Duchess tribe of animals, (at present most highly esteemed,) carried on, in a great degree, by gentlemen from America, who seemed determined to out-bid the English breeders, as well as one another. One cow brought 700 guineas, equal to $3,500; another brought 600 guineas, equal to $3,000; and others, something less, though all went at high prices.

The next sale, in point of time, is that of Mr. Tanqueray, of Hendon, a gentleman who, though he did not continue long to breed, engaged in it with the utmost spirit, and generally obtained the best stock that could be had, with little regard to price.

This sale came off on 24th April, 1855, when there were sold,

77 cows, heifers, and heifer calves for	£5915 14 0
24 bulls, and bull calves,	1928 17 0
	7844 11 0
Average per head.	77 13 4½

Equal to about $376 00.

The next sale in order was that of Sir Charles Knightly, of Falseley Park, which came off in April, 1856. Sir Charles had been breeding with the strictest attention to the purity of the blood of his herd, for thirty-five years, during which time I believe he had never sold a female fit for breeding from it.

There were sold 48 cows, heifers, and heifer calves for £3979 10 0, equal to $18,950.
There were sold 29 bulls, and bull calves for £2184 0 0, equal to $10,400

Total 77hds. fr.	£6163 10 0,	equal to $29,350
Average of females.	£82 18 ½,	equal to $39,479
Average of males,	75 6 2½,	equal to 358,62
Average of whole,	80 1 0,	equal to 381,16

I have, hitherto, omitted to give any account of the high prices given in America, for Short Horns, as well as those paid by purchasers at private sale, of which I may here make some mention. At the "Sciota Valley Importing Company's" sale in Ohio, in 1852, there were sold nine bulls for $13,460; highest price $2,510; lowest $450—average per head, $1,495 55. There were sold seven cows for $8,315; highest price, $1,230; lowest $900—average per head, $1,187,85. Sixteen head sold for $21,775—making an average of $1,361 per head.

In the following year, 1853, at the sale of the stock of the Northern Importing Company there were sold

10 bulls for $28,681; highest price, $6,001; lowest, $1,000—average, $2,868 10.
15 cows and heifers, $19,025, highest price $3,050; lowest, $535—average, $1,268,33.
—
25 head of bulls and cows brought $47,706—making the average price per head $1908,24.

This sale is, without doubt, the highest ever made; but a bull, "Master Butterfly," has been recently sold in England, at private sale, to get to Australia, for about the same price that Diamond, highest priced bull brought at this sale; and though no recent private sale has reached the high figure of $3,500, for which one of the Duchess tribe sold at Lord Ducie's, or $3,050 paid for Mazurks, at the Northern Kentucky Importing Company's sale above mentioned, 500 guineas or $2,500 was confidently looked for, as the selling price of the first prize cow at the Royal English Agricultural Society shows this year, nor would it be surprising that the price was obtained.

It will thus be seen that since the attention of the public was first called to this breed of cattle, they have been constantly advancing in favour, and though, in times of feverish excitement, the prices given for them may, in some instances, have been higher than can be obtained just now, it may be said, that never since their origin have they been more popular than at the present moment. Recommended by their intrinsic merits, the Short Horns have overcome all prejudices, whether of a local or national character.

They have been introduced not only on the continent of Europe, but as we all know, have long since crossed the Atlantic, to this country and Canada, and more recently have been successfully tried in Australia. This, of itself, is sufficient proof of their great merits; but it may be added, that wherever they have been introduced, a decided improvement has been uniformly observed, and it can scarcely be deemed too great praise of this remarkable breed of cattle, to say, that whether for the purpose of crossing other stock, or, (being bred pure,) for the purpose of grazing or feeding, or for the dairy, no known breed can be found to equal them.

R. AITCHESON ALEXANDER.

Cord-Wood Houses.

A new method of building has been suggested, but we are not aware that it has ever been "put in the papers." It is claimed to be equally as good, if not better than the old plan of building frames, while, in all wooden regions, it has the merit of being very economical. Any one possessing timber, or living where it is cheap, can, by this new method of house-building, erect them a neat and comfortable house, with the outlay of very little means. The principal cost is the outlay of labor, which any one with skill enough to build an ordinary board fence is capable of performing.

How to Build.—First saw and split your wood, the same as for the stove, of the same length as you desire your walls to be in thickness. If you want your walls one foot thick, cut your wood twelve inches long; or if eight inches is to be the thickness of the walls, then cut your wood only eight inches long, varying the length of your wood to any desired thickness you wish your walls. After laying your foundation wall in stone or concrete, as for frame dwellings, erect two planks on edge, at the distance apart of the thickness of your wall, and secure them by cross ties. Now proceed to lay in your cord (or stove) wood, putting in a layer of mortar between each layer of wood, so that all the chinks and crevices may be perfectly filled. The mortar will fill all irregularities at the end of the wood, and leave the face of your wall perfectly even and smooth. When you have filled in your wood and mortar to the height of the plank, you can loosen the ties and raise the plank, or slide them along the wall, preparatory to another layer or extension of the wall. At the corners of your building, you will lay every other tier of wood at right angles, the same as you would cord up the end of a pile of wood. When you get your wall to the desired height for the first story, lay across your joist or floor timbers, being careful to get them all level, and proceed as before until you reach the desired height of your house, when proceed to level off your wall, and place planks thereon for the rafters to rest, tying them at the corners. After erecting the end rafters and staying them, you can proceed to lay up the gable the same as your main walls. The door and window-frames of heavy plank can be put in their places as the erection of the wall proceeds. The inside walls can be erected at the same time as the outside, or afterwards, at the option of the builder. The floors, roofs, etc., will be like unto other houses. Thus erected, the inside walls of the house will be smooth enough to paper, or a coat of plaster will readily adhere to them, if the owner desires. The outside, for a neat and economical cottage residence, need only be whitewashed with a waterproof whitewash, the same as that used on the back part of the President's mansion. If the owner desire it, he can readily clapboard, or put on a hard finish, as may accord with his taste.

Double Walls.—The foregoing is a cheap way of building a good house; but a still better way is to make the walls double, with a dead-air space between. Cut your wood for a double wall, say, six inches long. Lay up two tiers, or walls, side by side, with a hollow space between. To make the walls firm, occasionally tie them together by sticks long enough to reach through this dead-air space by only carrying up cross partitions of wood, the distance apart you desire your chimney, and thoroughly plastered on the inside.

Comfort and Economy.—That such a house should be warm in winter, and cool in the summer, no one can doubt who has paid attention to the manner of its construction. But is it economical? It is capable of being constructed, so far as the walls are concerned, by any skilful common laborer. This is an advantage over the common method of building, as on that skilled mechanics have to be employed, at high wages. The amount of wood required is much less than would at first appear, as any one who makes an estimate will find. Thus, for a small cottage size, sixteen by twenty feet, and one and a half stories high, it will take less than seven cords of four-foot wood. It is considerable labor to cut the wood, but in many cases the labor will not be felt, as it could be done at odd hours, and on rainy days when little else would be done. All expense in the body of the house for nails, laths, etc., would be done away with, and there would be a slight additional expense for mortar, it taking more than by the old method.

In conclusion, we would say, this method of building is capable of being applied to out-houses, and the double wall-plan will make excellent ice-houses, or above-ground cellars, on account of the non-conducting power of the walls.—*Philadelphia Dollar Newspaper.*

The Trade, etc., of Havana in 1858.

From a highly interesting table in a late number of the *Diario de la Marina*, the Savannah *Republican* translates the following items, which will be read with interest by our business men generally:

"There arrived in the port of Havana, for the year 1858, 132 American merchant steamers, against 167 in 1857. Sailed in same time 130, against 165 in 1857.

"The number of passengers arrived from the United States in 1858 was 4,887. The total number of passengers from all points was 31,555.

"The number of vessels touching at the port of Havana in 1858 was 958, of 392,572 tons, against 909 vessels, of 406,873 tons, in 1857. Vessels from all points during the year 1849, of 679,815 tons, against 1,953, of 696,366 tons, in 1857.

"The total exports of Sugar from Havana and Matanzas for the year 1858 was 1,268,150 boxes, against 1,116,696 boxes in 1857; of which to the United States 349,135 boxes, against 302,112 boxes in 1857.

"Total exports of Coffee from Havana in 1858, 20,483 arrobas, (25 lbs.,) against 19,609 arrobas in 1857; of which to the United States 7,734 arrobas, against 31 arrobas in 1857.

"Total exports of Molasses from Havana in 1858, 21,545 hhds., against 30,161 hhds. in 1857; of which 18,765 to the United States, against 23,804 in 1857.

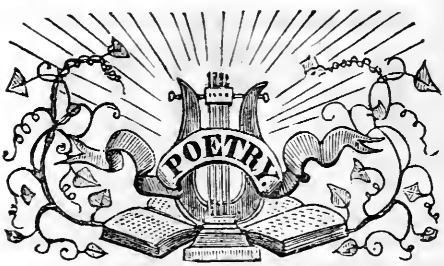
"Total exports of Rum for the year 18,415 pipes, against 14,058 in 1857; of which to the United States 919 pipes, against 250 pipes in 1857.

"Total exports of Cigars 106,231,000, against 146,720 in 1857. Of unmanufactured Tobacco 5,046,896 lbs., against 3,590,135 lbs., 1857.

"Total exports of Honey 1,679 tierces, against 1,640 in 1857; of which to the United States 234 tierces, against 264 tierces in 1857.

"Total exports of Wax 37,016 arrobas, against 49,732 arrobas in 1857; of which to the United States 373 arrobas, against 80 arrobas in 1857.

"Total imports of Rice for the year—from the United States 76,877 quintals, (100 lbs.); from Spain 72,486 quintals, and from India 115,273 quintals."—*New Orleans Commercial Bulletin.*



A Psalm of Life.

Tell me not, in mournful numbers,
"Life is but an empty dream!"
For the soul is dead that slumbers,
And things are not what they seem.

Life is real! Life is earnest!
And the grave is not its goal;
"Dust thou art, to dust returnest,"
Was not spoken of the soul.

Not enjoyment, and not sorrow,
Is our destined end or way;
But to act, that each to-morrow
Find us farther than to-day.

Art is long, and Time is fleeting,
And our hearts, though stout and brave,
Still, like muffled drums, are beating
Funeral marches to the grave.

In the world's broad field of battle,
In the bivouac of Life,
Be not like dumb, driven cattle!
Be a hero in the strife!

Trust no Future, howe'er pleasant!
Let the dead Past bury its dead!
Act,—act in the living Present!
Heart within, and God o'erhead!

Lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time;

Footprints, that perhaps another,
Sailing o'er life's solemn main,
A forlorn and shipwrecked brother,
Seeing, shall take heart again.

Let us, then, be up and doing,
With a heart for any fate;
Still achieving, still pursuing,
Learn to labor and to wait.

Longfellow.

Wishes.

All the fluttering wishes
Caged within thy heart
Beat their wings against it,
Longing to depart,
Till they shake their prison
With their wounded cry;
Open then thy heart to-day,
And let the captives fly.

Let them first fly upwards
Through the starry air,
Till you almost lose them,
For their home is there;
Then with outspread pinions,
Circling round and round,
Wing their way wherever
Want and woe are found.

Where the weary stitcher
Toils for daily bread;
Where the lonely watcher
Watches by her dead;
Where with thin weak fingers,
Toiling at the loom,
Stand the little children,
Blighted ere they bloom.

Where by darkness blinded,
Groping for the light,
With distorted countenance
Men do wrong for right;
Where in the cold shadow,
By smooth pleasure thrown,
Human hearts by hundreds
Harden into stone.

Where on dusty highways,
With faint heart and slow,
Cursing the glad sunlight,
Hungry outcasts go:
Where all mirth is silenced,
And the hearth is chill,
For one place is empty,
And one voice is still.

Some hearts will be lighter
While your captives roam
For their tender singing,
Then lead them home;
When the sunny hours
Into night depart,
Softly they will nestle
In a quiet heart.

Give.

See the rivers flowing
Downward to the sea,
Pouring all their treasures
Bountiful and free—
Yet to help their giving
Hidden springs arise;
Or, if need be, showers
Feed them from the skies!

Watch the princely flowers
Their rich fragrance spread,
Load the air with perfumes,
From their beauty shed—
Yet their lavish spending,
Leaves them not in dearth,
With fresh life replenished
By their mother earth!

Give thy heart's best treasures!
From fair Nature learn;
Give thy love,—and ask not,
Wait not a return;
And the more thou spendest
From the little store,
With a double bounty,
God will give thee more.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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For the Southern Planter.

Irrigated Meadows.

Mr. Editor:

Most of your readers are no doubt aware of the fact that irrigated or "watered meadows" are not uncommon in some parts of our State, particularly in some portions of the Valley. Knowing something of their value, the ease of keeping them up, &c., the only surprise with me is, that more attention is not paid to them in a region so eminently suited to this means of improvement, as are the Valley and other portions of Western Virginia. Having made many inquiries as to the modes of preparing the ditches for irrigation, the best times of letting on the water, the time and labor necessary to keep up these meadows, and above all, having become thoroughly convinced of the great superiority of irrigated over ordinary meadows, I propose to give the result of my inquiries to the readers of the Planter, with the hope that by thus directing public attention to the subject, many farmers who may have bold springs on their farms, or small streams running to waste through them, may turn them to profitable account by using the water to irrigate portions of their meadows.

Irrigation can only be resorted to with advantage in regions of country that are more or less rolling, and the smaller streams somewhat precipitous, so that the water may have sufficient head to admit of its being carried around slopes of very considerable width, and the slopes themselves may have sufficient fall to carry off all the water so as to leave none to stagnate. In England irrigated meadows are resorted to wherever water can be had in sufficient abundance; but in Virginia, irrigation is only practised so far as I know, in the limestone regions, such as the Valley and some other portions of Western Virginia, and even here only to a very limited extent. That irrigation might be practised with advantage in some of the counties east of the Blue Ridge I have no doubt, but as my object is not to recommend an untried system, but rather to urge a more extensive use of a means of improvement which from observation I know to be specially suited to the Valley and certain regions to the west of it, I will simply say that, the farmer living in the portion of the State referred to, and who can command the necessary water, could not do better than to resort to it.

That those who know nothing of the practice may form some idea of the advantages of irrigation, I would state as the result of my observation and inquiries that, a piece of irrigated meadow in this Valley will, if kept in condition, and the water properly used, yield from one and a half to two tons or more per acre of the first quality of hay, and will besides furnish excellent pasture from August until winter, or until the meadow is covered with snow. This the meadow will do year after year, without any other manure than that contained in the water used to irrigate with. I know of an irrigated meadow that has been in the present owners possession for the last fifteen years, yielding annually from one and a half to two tons of hay to the acre, with the very best of fall pasture, and I am assured that in all that time no manure of any kind has been applied. The only attention that the meadow has received, has been the cleaning out of the ditches in spring, and the letting on of the water at proper intervals, from early spring until near harvest. It is understood that this same meadow has been under this same treatment for the last forty years. That the crop of grass is due to the water, is evident from the fact that, if the water is not properly regulated, and made to flow over the entire meadow, the crop of hay is very much lessened, and those strips that have not had the benefit of the water, are frequently scarcely worth the cutting. The hay, if the meadow receives proper attention, is of the first quality, equal to any produced on upland meadow, and the fall pasture is sweet and nutricious, giving a fine flavor to the milk and butter of the cows pastured thereon.

From the above facts, it must be apparent that irrigated meadows are very profitable, requiring much less care and labor than any of the other crops saving ordinary meadow only, and the crop when produced, taking into the account both hay and pasture, yields a larger annual return than any of the grain crops.

In preparing a piece of meadow for irrigation, it is necessary to have such an arrangement of large and small ditches as that, when the water is let on the meadow, it will spread itself in a thin sheet over the entire surface, and yet will not remain on it long enough to stagnate. The usual way of accomplishing this, is to dig a series of main ditches, capable of carrying considerable bodies of water, and to take the water from these by a series of very small ones. The first of the main ditches leaves the stream or spring at the highest point practicable, and winds along the hillside, preserving a uniform but very slight fall—the fall being proportioned to the head of water. If the head is strong, the fall should be very slight, as the ditch in that case would always be easily kept full; if, on the contrary, the supply of water is quite limited, a greater fall to the ditch becomes necessary. The ditch may lead directly from the stream by simply turning the water into it, or a dam may be constructed, and the water taken from that. Unless the meadow is very narrow, additional ditches below this will be necessary; they should be so situated that when the water is let on the meadow, the spaces between the ditches will be thoroughly watered, and yet no water wasted. Their distances apart will, of course, depend upon the head of water, the slope and nature of the ground, &c.

The main ditches having been made, it remains to show how to take the water from them and secure its uniform distribution over the meadow. This is done by first damming the ditches at their lowest points so as to throw the water over the whole meadow at once, or what is more common, to have gates in them at regular intervals, so as to flood a section at a time. The best way to construct these gates, is to drive down two pieces of stout board across the ditch, leaving a passage way for the water between them, and to have a third piece to slide up and down between the first two. By this arrangement the water can be thrown from one section to another in a moment. These gates should be so placed that, when one is closed the water in the ditch above it shall be dammed up to the next gate above, so as to insure a flow of water over all of the meadow embraced between the two. The lower bank of the ditch may now be of an exact level from one gate to the next above, and of such a height that when the water is dammed back, it will flow over the bank from gate to gate in one uniform sheet. This plan does very well in certain localities, but unless the meadow below the ditch is very favorably situated, it is almost impossible to secure a uniform flow of water over it.

A better method is to make small openings in the lower bank of the ditch at regular intervals, letting the water flow out of these, and causing it to spread itself over the meadow by making with a hoe a series of little trenches in the soil, all of which radiate as it were, from the outlet in the main ditch. These outlets may be made a little below the general level of the water in the ditch, so that as the water flows along in the ditches a portion may always be passing out upon the meadow. If the supply of water is limited, the meadow may be watered in sections by stopping up all of the outlets except those along the section to be watered. By this arrangement very little, if any, damming back becomes necessary, but the constant opening and closing of the outlets attendant upon it, is a source of no little trouble and loss of time. A still better plan consists in so cutting the outlets for the water, that their bottoms shall be a little *above* the level of the water when it is flowing along the ditch unobstructed, and yet so low that when the water is dammed back, it will flow out of all the openings from the closed gate to the one next above. By this arrangement the water is more easily managed, and the letting it on, and taking off, are attended with much less trouble.

The particular manner in which the water is applied, will necessarily depend in a great measure, on the supply; however, whether that supply be large or small, the water should go on the grass as early in the season as possible. It is universally conceded that, if care is taken to irrigate well in winter, when the weather will permit, and in the early spring, we have the best guaranty for a good crop. At that season the water may flow continuously for a considerable time with decided profit; as the spring advances, however, it ought to be taken off occasionally, and when the warm weather comes, it must be used with great caution to prevent "scalding" and the displacement of the meadow grasses by coarse aquatic species. During the growing season it is important that the grass should have air as well as water, and hence, the necessity for a regular alternation. Some farmers allow the water to flow as long as they can with safety, and after draining it off, keep it off a considerable time, not so long however as to let the sod get so dry as to bake. Others prefer, and insist upon it, that it is the best plan, to put it on from twelve to twenty four hours at a time, leaving it off a corresponding space of time, or longer. When the meadow is large, or the supply of water small, the latter is the only practicable way to irrigate. I know of meadows that are laid off in sections corresponding to the days of the week, so that each section gets the water one day in seven.

The ditches, &c., require cleaning out and some little other care in the winter or early spring; the only after attention necessary, is at stated times to let the water over one section and take it off another, a process which consumes but little time, and gives very little trouble.

William Gilham.

V. M. I., March 1st., 1859.

For the Southern Planter.

The Capabilities of the South for Fruit Growing.

The opinion has very generally been entertained heretofore, that the South cannot compete with the North in fruit growing, particularly the apple. Various causes may be assigned for this opinion, and prominent among these, has been a want of adaptation of suitable varieties to our soil and climate, and a neglect of proper culture. The idea has too generally prevailed, that what suits one region would suit another, and, when failure occurs, we too often allow ourselves to become discouraged and give it up, instead of enquiring into the causes of failure and resolutely determining to persevere until success crowns our efforts.

Our country in its wide area, presents a great diversity of soil and climate, and this diversity must exert an influence in fruit culture, as well as in any other kind of culture. One fact that has been too little attended to, is the length of time and degree of heat that different varieties of fruit require to bring them to perfection. In the South fruit trees bloom in the spring from one to two months earlier than in the North, and have longer time to grow before cold weather, hence a Northern winter fruit obtains length of time and sufficiency of heat to ripen it before cold weather commences; when planted in the South, it then becomes over ripe before winter and will not keep long. This is just what we might expect, if we would look at it scientifically, and a man from the South, moving North, who should attempt to raise cotton as a farm crop there, would be considered as wanting in judgment. And yet one conclusion is just as rational as the other, if we would look at it aright.

Much has been said and written about the failure of our orchards of late years, and the idea is entertained by many that we cannot grow fruit as early as formerly. What then? Shall we give it up in discouragement, and idly resign ourselves to our fate, and blame mother earth for our faults, or rather shall we not earnestly investigate the cause and apply the remedy? We all know that our wheat crop is not as certain as formerly; do we think of giving it up? I judge not. Agriculturists are looking round for a remedy, and endeavoring to investigate the causes of failure. English writers are boasting, that they now calculate upon an average crop of wheat with far more certainty than formerly. They now find that by studying the requirements of the crop and of the soil, that they can apply manure with far more certainty of success than heretofore. Here is a lesson that the agriculturists of this country are beginning to learn, and to learn successfully. And pomologists should profit by this lesson also. While our soil was in its primitive condition, there seemed to be no difficulty in raising fruit, it only needed planting, and it would take care of itself. But as our soil became exhausted of some of its important constituents by continued cropping, success is not now so certain. And added to this, the dry summers and cold winters of the past few years, have caused a destruction of fruit trees, the like of which few of us can remember. Our forest trees also have suffered severely. Cannot we see the reason of all these things? The want of proper culture of fruit trees under the circumstances in which they are now placed, is one main reason of so much failure. A farmer who would plant one kind of crop on his land for 30 or 40 years, without manure to supply the draft upon the soil, would be considered wanting in common sense, and yet how much more sensible is it, to expect a fruit tree to yield fair crops of fruit for that many years without something to supply its wants? It may be said that the roots of the tree yearly extend themselves farther out, and thus constantly is reaching new soil, but does not the farmer anticipate these roots by cropping that soil, and thus robbing the roots of their fair share. Here is a grand error and one that has done incalculable injury to orchards. Look at nature, look at the forest trees in a state of nature, they invariably throw out their roots close to the surface of the ground, with a net work of fine roots just beneath the surface. Here they come into contact with the decayed vegetable matter furnished by their growth, and thus are yearly manured. How is it with our orchards, we crop the ground between the trees, and of latter time plow much deeper than formerly, thus destroying the surface roots and compelling those left to penetrate deeper into the subsoil, into a colder state, and one almost entirely deficient in organic matter. Experience shows us that however rich in other matters a soil may be, if there is a deficiency of organic matter in it, a good crop cannot be grown upon it. Can we be at a loss why our orchards do not bear better? When we look at the facts before us, is it not rather a wonder they bear at all, at least many of them?

Want of adaptation to soil is an error with many tree planters. Some varieties of apples require a strong, heavy soil to bring them to perfection, while others do best in a good but lighter soil. We should endeavor to obtain native varieties for each section of our country, as much as may be. This has been a want in the South heretofore, but is now being supplied. D. Redmond of the Southern Cultivator, Augusta, Georgia, read a paper at the late meeting of the Pomological Society in New York, on the capabilities of the South for fruit culture, in which he gave a large list of varieties of Southern origin, and adapted to that region, of good size and superior quality; some of which, he says, will hang on the tree till the beginning of winter, or even Christmas. Most of these varieties would probably succeed well in the tide-water region of our State, and many of them except the very latest, would suit the upper Piedmont and Valley region; and as many of them are natives of the highlands of Northern Georgia, North Carolina and East Tennessee, these might suit the Alleghany region and the Western counties of the State.

I see no reason why, with proper care in selecting varieties, and judicious cultivation, we may not raise fruit in this as well as any other State of the Union. The practice of doing things on a large scale, and neglecting things seemingly small, has had much to do with the small amount of fruit produced for market, but this in time will correct itself. There are a few earnest pomologists in different parts of the South, that are manifesting what may be done, and when they give as they will give, occular evidence of the profit of fruit culture, there is Yankee spirit enough even there, to carry the thing out, now that public conveyance will soon be easy to distant markets. Look at Eastern Virginia, how they there are falling into the truck business as it is called, and how they are enriching the country, and building up a business that is a benefit to both South and North. There is little danger of this business being overdone soon; our cities increase faster than the production of the country increase, and then the foreign market might be made use of, should there be a surplus for home use.

HOW TO PLANT FRUIT TREES.

In planting orchards, care should be taken that the soil has sufficient drainage, to prevent water standing about the roots; if not so naturally, it should be underdrained. Trees two years from the graft, are now considered by all intelligent fruit growers, better for planting than older ones, they can be taken up with less injury to their roots, and they grow off more freely, and in a few years make larger and better trees than larger ones will. Care should be taken to set them no deeper than they grew in the nursery.—The holes should be 3 or 4 feet square and 1½ deep, and in planting use only top soil if good, and if not, make it so, by adding compost or well-rotted manure, but use no unfermented manure. Fill the hole partly up, then place the roots in their natural position, and fill the fine soil closely in and around them, do this carefully, then pour a bucket of water around them to settle the earth more closely, and cover all over with earth, pressing it down moderately. By planting in this way, and mulching the first summer with straw, leaves, or other litter, for 3 or 4 feet around the tree, there will be very few failures, provided the trees have not been too long exposed to the air before planting. For several years after planting, the ground should be cultivated in vegetables, say potatoes, vines, &c., but not in winter grain or tall growing plants. Care should early be taken, not to plow the ground close to the trees, and as they increase in size increase the distance from them so as not to disturb the surface roots, but keep down grass and weeds around them. Much injury is done to orchards in this particular, the surface roots are torn off, and the remaining roots are compelled to penetrate the subsoil, divested of the benefit of the sun and dews, and confined to a colder stratum. These surface roots extend much farther than most persons imagine. Downing, in his work on fruits, some years ago, advised those who kept their fruit trees in grass, to dig the surface over at least as far as the branches extended, but this has been found to be too small a space, and does little or no good.—Roots often extend twice as far as the branches spread out, and as it is through the small roots at their extremities that the tree obtains its nourishment, we may at once see the reason of the injury of crops of grass or other vegetables growing within their reach. Persons who wish to grow fruit with certainty and successfully, must avoid injuring the surface roots, and avoid robbing them of their nourishment by cropping over them. While the trees are young the spaces between them may be occupied, but when they attain size, and come into a bearing state, crops of fruit and vegetables cannot be successfully grown together without copious manuring, and then the injury done to the roots will be considerable, unless particular care is taken to prevent it. Marshall P. Wilder, in the late Pomological Convention, "mentioned an orchard in Massachusetts which sends the finest apples to the market, where there has been no grass or plough for forty years. The top of the ground is merely scarified."

The small importance attached to fruit by many farmers, will induce them to consider this too much trouble, they cannot afford it, they can take very especial care to provide for a tobacco or other crop, and yet there is no crop which can be put upon land that will produce as much real profit per acre as a well kept orchard. They all love good fruit, and yet don't seem to try to learn its value. It will go very far in supporting a family if rightly managed, is promotive of health and social enjoyment, and a lack of endeavor to obtain it, where it may be had, is pretty sure evidence of a want of that refinement that makes man the friend of man.

Our State may be considered as exhibiting four distinct regions for fruit growing. The first may include the Tide-water and about one-half of the Piedmont region, with an elevation of say, of 400 feet above tide. Here, for late keeping fruit, we should look to those of Southern origin almost exclusively. Much of this soil being sandy and thin, to ensure good fruit manure should be applied. The second region may extend from the first to the western side of the Valley region, with an elevation of from 400 to 1500 feet above Tide-water. This is the best region for apples in the State, and with proper attention and selections of varieties, may be made equal to almost any other in the Union. The chief drawback is, the liability to injury from spring frosts, but there are many elevations where this would only be partial. Here Northern varieties do better than in the first division, but still our main dependence should be from the South. The third region may include all the mountains west of the Valley. The valleys in these mountains are many of them similar to the Valley in fertility of soil, but many of them reaching to 2,500 feet above tide-water, would allow of Northern fruit doing better there than either of the other regions, but still the native fruits of the Southern Alleghanies, should be mostly depended on. That part of the State west of the Alleghanies having an elevation about equal to much of the Valley region, would seem to need pretty much the same varieties of fruit. The present system of railroads when finished will give facilities for conveyance that will make the raising of fruit more profitable than heretofore in many places.

In reviewing the facts before us, there seems to be no good reason to suppose that Virginia may not become a profitable fruit growing region. Of peaches she has a decided advantage over the North, the trees are longer lived and the quality of the fruit is superior. Of apples, with a judicious selection of varieties and proper cultivation, there is decided encouragement. But we must lay aside that careless manner, too much in practice at present, and take up a scientific course of cultivation.

The laws governing fruit culture are as certain of producing reliable results as the laws of any other branch of culture, and it is our duty as well as interest, to understand those laws, and apply them to our profit. Of pears we have much yet to learn, in many places we see large old pear trees growing thriftily, proving that our soil is adapted to that fruit, but its culture seems to be checked by the blight here as elsewhere. When we shall produce native varieties, we may expect to be more successful, till then we must select those best adapted to our region. The dwarf pear requires such peculiar treatment, that its cultivation cannot be recommended, unless where proper attention can be given to it. Much imposition is practised by tree venders in this particular, and the want of information in many, renders them easy dupes to these schemers. Persons from other States have been distributing fruit trees from the North into this State the past two years, professing to furnish better fruit than can be obtained here, and selling at higher prices than nurseries here sell for, and thus imposing on the credulous and ignorant, most of whom will not soon realize the return of their money, and many of them never. This evil should be corrected, but while our citizens delight more in politics and making a show in the world than in the quiet and peaceable practice of adding to our comforts, and making our homes a blessing to our families, as well as ourselves and all around us, there is but little prospect of a remedy. A word to the wise is sufficient.

Yardley Taylor.

For the Southern Planter.

War against Wash-Boards Continued.

The attention of house-keepers was, some months since, called to the great injury done to the clothes of a family, by the weekly use of a wash-board. In most cases, the lady of the house sees the clothes delivered to the washer-woman, and, in some instances, takes a list. If the clothes come in at the usual time, and are clean and nice-looking, she is satisfied. When the Spring of the year comes round, and the good mother sees the time is approaching for the little ones (and the old gentleman too) to shed their Winter apparel, she orders the Summer clothes to be brought out. As they are spread out before her, she, with a flushed cheek and ruffled temper, exclaims, "how on earth did these clothes get so ragged and torn? Some, I know, were made up late last Summer, and even they are rubbed to pieces." The washer-woman puts in a word or two to the effect, that "the boys, mam, are monstrous hard on their clothes; they get them so dirty and greasy I has to rub them with all my strength to get them clean."

"But how is it, Evelina, that the girls' clothes are so linted up? Only look, new dresses, new underclothes, even the stockings, are all rubbed, as though you had scoured down the kitchen steps with them."

"Oh, *mistis*, you know the girls, *they's* just like the boys. You know they are up the cherry-trees, down in the raspberry patch, up the chinkapin bushes, anywhere and everywhere."

The mother concludes that she never knew such children, and resolves to whip for every rent she sees in the future. If the good wife (it is presumed all wives are good, if they are not they should be, or the chimneys are sure to smoke,) would only pay one or two unexpected visits a day to the washer-woman, she will find one of those wonderful goods destroyers sitting up in her tub, or if its use has been forbidden, it will be found lying flat at the bottom of the tub. I have not space to enumerate the fine and costly articles belonging to the young and old folks, of every family, that are rubbed to a perfect lint on the wash-boards used in one large family. Every old cobler that can handle a saw and a chisel makes them for the colored folks, and every merchant and grog-shop keeper has them for sale. And why do they? Is it for the small profit made on them? No, it is not. What then? Why these merchants have learned from the thoughtfulness of Northern men how to calculate, something after this fashion: "Every wash-board I can sell will, in all probability, *lint out*, in one season, three dozen shirts, two dozen fine and costly handkerchiefs, to say nothing of the fine under-garments worn by every young lady, and a host of fine and costly things besides, on which I make my profit." And the washer-woman has learned from the merchant, that if she will purchase and use wash-boards, (even if she has to use her own money,) that she will be able to collect rags enough every year (at one cent a pound) to supply her with everything she might want from the store. Thus, you see, the merchant and washer-woman are deeply interested in the destruction of all linen and cotton goods—the more clothes are worn out the more goods are purchased by every family, and the more rags are sold by the good and faithful old washer-woman.

Persons who do not look into family matters as they should, and as their interest oftentimes requires, may laugh at this ridiculous war against wash-boards. But only think for one moment of the poor farmer—these uncertain seasons for cropping—who is toiling from year's end to year's end, and his wife and a sewing girl, are hard at work with their needles six months of the year, (or, perhaps, Wheeler & Wilson's family sewing machine, the best in use, making 1000 stitches a minute,) all to be paid for by the farmer, crop or no crop; and who is benefitted? Who makes the money these hard times? The merchant. How does he do it? By selling goods to the farmer at 30, 40, or 50 per cent., and by supplying a machine to wear them out in time to be purchased back again at one cent a pound, to be taken North the next season. Will not some observing man join in trying to bring to the notice of housekeepers the loss sustained, yearly, to every family in which wash-boards are used. I estimate the loss to each family at $50 per year.

A VALLEY FARMER.

February, 1859.

From the Valley Farmer.

The Horse.

As the present high price of horses will induce all who can to raise and bring them into market, it is but reasonable to suppose that many mares will be used for breeding, whose progeny will prove of very little value. In the present instance I propose to consider something of the results to be expected from a judicious course of breeding, and vice versa. In the selection of a stallion to breed to, inasmuch as nearly every one is within reach of a good many, most persons are called upon to exercise some judgment in making a choice, and in order that the choice may prove a wise one, see to it that you consider well the object in view, viz: What kind of a colt do you wish to produce? Consider the qualities of your mare and also the horse, and after all do not breed to the price of the insurance instead of breeding to the horse. A dollar or two now may make a difference of fifty or more a year or two hence. In order to a perfect development in the foal, the mare should be relatively larger than the horse. A large, loose-made mare, from a smaller but muscular and ambitious horse, will rarely fail in producing a valuable colt. The mare being large and roomy there is ample space for developing in the fœtus the full powers of the horse in an eminent degree, giving it remarkable strength, activity and constitution. The correctness of this principle will be readily seen in the effects produced by this course of breeding. Doubtless every reader can point to a number of small horses, (Canadians and others,) which have sustained a high reputation amongst stock raisers throughout their whole lives. The justly famed Morgans, and the advantages to be derived by crossing them upon common stock afford a striking illustration of the truth of this remark. The Mustangs of the western plains, as well as all *wild* horses, are remarkable for their hardihood and bottom. When it is remembered that the medium and smaller sized horses are always masters in a herd and consequently the race being perpetuated by them, another example is afforded, carrying out the truth of this observation. By crossing the large English mares with the (smaller sized) horses of Arabia and the Barbary States, some of the fleetest horses in the world have been produced. The superior hardihood and endurance of the mule may certainly be attributed, in a *great measure*, to breeding upon this principle. Jacks being smaller than mares, there is a full development of the powers of both parents in the offspring. Some may say that the jack is a more hardy animal and not subject to so many diseases as the horse, hence the result, but this does not explain the true cause of superiority. If *this* had been the reason, the produce of the stallion with the jennet ought to be equally as serviceable as the mule, but experience has proved that the offspring which is called a *Hinny* is a worthless animal. Colts produced by crossing small mares with large horses are frequently tall and ill-shaped, awkward and sluggish, also deficient in constitution. Of course there are exceptions, but this is the *natural* tendency. From this fact the improvement of our stock by importing very large horses, has not been attended with such marked results, as has been attained by a different course of breeding. An error has been committed in importing large horses instead of mares, and although a good many valuable horses are to be found among the colts of imported draught horses, there are many others that will not compare favourably with the common breeds of the country. A large breed cannot be kept perfect and condensed by raising from females of smaller size.. Either the form, the spirit, or the constitution must be sacrificed, perhaps all. But you are ready to ask, How are we to keep up the size of our horses and practice upon this principle? Many small horses breed large, and their colts will, in nearly all cases, be large enough. If, however, you have a small mare, I would not advise breeding to a still smaller horse, but after breeding to a larger one, if the colt should prove deficient, correct again by reversing. Perhaps enough has been said upon this subject to lead you to think and observe. If so, my object has been attained. Lessons of experience are always readily fixed upon the mind.

Some difference of opinion is entertained as to which exerts the greatest influence upon the offspring, the male or the female. I think, however, that owing to the peculiar treatment and habits of the stallion, a deeper impress is generally made upon the side of the sire than of the dam. Taking this for granted, and also bearing in mind that "like produces like," it is a matter of great importance that the stallion especially be free from defects and blemishes. Spavin, curb, predisposition to splints, windgalls and all such things are hereditary. All these things are formed easily enough, without breeding to horses which have them. I would, for this reason, always discourage the idea of keeping a horse, unless entirely free from defects If a horse's legs fail he is useless, and if he inherits spavin or any such diseases, there is little prospect of his ever being permanently cured. Some suppose that if a horse has an eye knocked out, or is otherwise rendered blind by accident or ill-usuge, his usefulness as a breeder will not be effected, but this idea is erroneous. A healthy action and exercise of any member, muscle or limb, increases its vigour and power. Inactivity produces an opposite result. After the loss of the eye the nerves around that organ becomes paralized, and for want of exercise (whatever may have caused the blindness) become to all intents and purposes the same as if they had never existed, and consequently materially affect the progeny of the animal. Although the effects may not be seen in the first generation, they will surely be manifested at a later date by an exhibition of weak eyes, dull and sleepy-looking eyes, very small and bad colored eyes, and finally, total blindness. Stallions are perhaps more liable to go blind than any other hoises. If used as work horses, they are very apt to pull too hard. Many horses have been rendered blind from this cause. If saddle horses, by undue exertion in training they are sometimes strained and the eyes lost. If over-taxed during the season the eyes often fail; and again, a horse will often be seen looking through some crack in the stable, with his eyes fixed intently upon some object for many minutes in succession, thereby straining the eye and resulting finally in loss of sight. If any of these causes or even accidents may have rendered a horse blind, rest assured that the effect will be sooner or later manifested in his stock. Old Copperbottom, during his lifetime, was paced a distance of 90 miles, which he accomplished in less than 9 hours, but this resulted in the loss of his eyes. We find now that his descendants in this State, (Ky.,) as well as many others, are weak-eyed. I know a grandson of his whose eyes were, to outward appearances, as good as any I ever saw, now entirely blind, and his eyes failing without any apparent cause. It is also a well-known fact that the Copperbottoms are addicted to blundering. May not this be attributed, in part, to some defect in the formation and structure of the eye? If so, this is an important item for consideration. In conclusion, upon the subject of defects, let me say, if you are raising stock, breed to an animal in all respects free from blemishes; if you are buying stock, purchase such as are free from defects. These things are often produced by causes which you cannot control, and when selling time comes, (especially if the market is dull,) you must account for every puff, lump, or hair that is out of place. H.

A Chapter on Cements.

To "A Subscriber," who requests us to give a few directions for making a cement that will be useful in joining pieces of glass or earthen, and in uniting pieces of chemical apparatus, we would say that he will find, in the various works on chemistry, directions for making cements and lutes, by which the object he desires can be attained. We, however, furnish him with the following, which are laid down in the "Imperial Encyclopedia," a work published some 45 years ago in England. For the purpose of holding together broken pieces of glass, china, or two pieces if not broken, but which you wish to hold together, the writer says the juice of garlic is excellent, being strong, and, if the operation be performed with care, leaving little or no mark. Quick lime and the white of an egg, mixed together and expeditiously used, are also very good for such purposes.

Dr. Lewis recommends a mixture of quick lime and cheese, in the following manner: "Sweet cheese, shaved thin and stirred with boiling hot water, changes into a tenacious slime, which does not mingle with the water. Worked with fresh quantities of hot water, and then mixed upon a hot stone, with a proper quantity of unslacked lime, into the consistence of a paste, it proves a strong and durable cement, for wood, stone, earthenware, and glass. When thoroughly dry, after being applied, which it will be in two or three days, it is not in the least acted upon by water."

Cheese, barely heated with quick lime, as directed by some of the chemists, for uniting cracked glasses, is not near so efficacious.

A composition of drying oil and white lead is sometimes used for this purpose, but it is not very good.

The Germans use a cement prepared in this way: Take by measure, two parts of litharge, one of unslaked lime, and one of flint glass; let each be separately reduced to finest powder, and worked up into a paste with drying oil. It is said this compound will acquire a great degree of hardness when immersed in water, and is very durable.

Another German cement for joining wood, is made with pitch mixed with bullock's blood, linseed oil, and turpentine,—the whole of this must be put over a fire, in an iron pan, and as much brick dust added as will make them of the consistency of thin paste. The tub or cask to which this preparation is to be applied, must be perfectly dry before being laid on, and the chinks and crevices filled up with tow while the cement is warm.

Japan cement for pasting paper is made by mixing rice flour intimately with cold water, and then boiling it,—it is beautifully white, and dries almost transparent. It is much used in joining paper boxes and other articles of curiosity or commerce.

A cement for damp walls is made in this way,—boil two quarts of tar with two ounces of grease for a quarter of an hour in an iron pot; add some of this tar to a mixture of slaked lime and pounded glass which have been passed through a flour sieve, and been completely dried over a fire in an iron pot, in the proportion of two parts of lime and one of glass, till the mixture becomes of the consistency of thin plaster. This cement must be used immediately after being mixed, and therefore it is proper not to mix too much, or no more than will coat one square foot at a time, since it will quickly become too hard for use, and care must be taken to prevent any moisture from mixing with the cement. For a wall merely damp a coating an eighth of an inch will be sufficient. This coating may afterwards be plastered with a plaster of quick lime hair and plaster of Paris. This cement will join and hold stone together strong.—*Me. Farmer.*

Good Advice to a Farmer.

"Many years ago," said a Quaker friend, who told us the following anecdote: "Many years ago, a brother of the celebrated Benjamin West, who had been a cooper in this city, a man of sterling sense and integrity, purchased a farm some miles out of the city, which had been suffered to be over-run with briers and bushes. He was, for a short time, considered by his neighbor farmers as very far from being as wise as Solomon, or even themselves; but, in a few years, his was the best and most productive farm within fifty miles around him, and his fame as a farmer spread far and wide. One day a man came to him who was desirous of improving his farm, and asked him how he should do it. 'Go home,' said Mr. West, 'and make five or ten acres as rich as thee wants, and come to me and I will tell you what to do next.' 'But,' said the farmer, 'I have not manure enough to do that.' 'Very well, then go and prepare three acres, two acres, or one acre, in the same way; but what thee undertakes, do well.' The farmer," said our friend, "perfectly comprehended the advice, and, what is unusual, practiced upon and benefitted by it—leaving at his death, one of the best farms in the country." Go, and do thou likewise.—*Philadelphia Herald.*

From the Prairie Farmer.

Cure for Big-Head.

I have lately had letters addressed me requesting a recipe for curing the big-head in horses. The recipe was published (by my request) in *The Prairie Farmer* some years since, and if you think it best you may publish it again. It will or has cured ninety-nine cases out of the hundred: Oil origan 1 oz.; spirits ammonia 2 oz.; ditto turpentine 2 oz.; olive oil 1 oz.; pulverised cantharides 1 drachm; mixed and well rubbed on the enlargement once a day.

Yours, Stephen Millikin.

The Dairy---Selection of Cows.

We are not going into a discussion of the different breeds of the cow, as understood by cattle-breeders, but of the general characteristics of those best suited to dairy purposes. We care not what her breed, whether it be Short-Horn, Ayrshire, Devon, Hereford, Alderney, or Native, further than that she be a *good milker*. As to the *quality* of her milk, it would always be rich; as to the *quantity*, that may depend upon the size of the cow, and the amount of food she consumes. We have known cows that yielded thirty quarts of milk in the height of the season, which were not so economical to the dairyman as others not giving over twenty quarts. One ate enormously, the other moderately. It depends much, also, on the quality of the pasturage as to what description of cow the dairyman should adopt. A compact, even-bodied cow will frequently live and thrive, and do her best in milk, where a large rangy beast would barely live, and yield less milk than the other; while, in abundant pastures, where the food is easily obtained, the largest animal, giving a proportionate quantity, would be preferable. So, in the selection of his cows the dairyman should understand the *quality of his pastures*, equally with the description of cows with which he is to stock them.

DESCRIPTION OF A DAIRY COW.

As a rule, we should say, that a compact, small-boned cow of her kind, whatever the breed may be, is the most economical for the dairy. A rawboned, big-jointed, loose-made beast is usually a huge feeder, and a poor keeper, and although sometimes an extraordinary milker, is not, on the whole, a profitable one to keep. Our own style of dairy cow should have a small head, with a lively eye, and a light horn. Her neck should be thin, her shoulders open, or well spread apart; her ribs round, and extend well back towards her hips; her back straight; her loins and hip broad; her rump level; her flanks deep; her belly capacious, without being *paunchy;* her twist full and low; her udder clean, silky in the hair, with fair-sized taper teats, standing well apart as they issue from the bag. When milked dry, the udder should be small, and shrunken—not meaty—but when full, it should be plump, and hard; her tail fine; her legs and feet small; and with all these she should possess a quiet disposition. It may also be added, that she have a yellow skin *beneath* the hair, be the hair what colour it may, and the hair be fine, silky, and if possible, waving, or slightly curling. These qualities, of course, will make a *handsome* cow—an objection in the eye of no one, and certainly none to the disadvantage of the cow possessing good milking properties. A beast the contrary of this description, although possibly a good milker, is not desirable; and when the kind we have described is just as easy to be obtained, as the opposite, if one will but take a little pains, the standard of perfection, or as near to it as possible, may as well be adhered to as otherwise.

We say a yellow *skin*, as distinguished from a white, or pale one. A yellow skin usually indicates a *rich* milker, while a pale skin indicates that of inferior quality. All observing dairymen will acknowledge this fact. Exceptions occur, but the rule obtains.

Now, in contradistinction to *our* choice of a cow, let us see, for a moment, how the mass of dairy cows are generally obtained. At "the West," where the cattle breeders usually pay little attention to the milking qualities of their cows, and breed them promiscuously without regard to that quality, and also in various other parts of the country among poor farmers who raise now and then a cow to sell, the cow drovers, or buyers go out to make their purchases for dairy markets—the dairymen, as a rule, do not rear their heifer calves, but depend upon purchasing their cows, either of the drovers, or go out and pick them up themselves, as best they may. Of course the selection by the drovers or dairymen, is not of the best, for the owners of them prize their superior quality as valuable to themselves, and the purchasers, consequently, are enabled to buy such only as the owners are disposed to sell. They are therefore a promiscuous lot—a few good, some indifferent, and many inferior if not decidedly bad. These cows are taken by the dairymen, and after trial a year or two, the worst are culled out by them as not worth keeping, and in turn are sold to another passing drover, who proceeds on his journey towards market, and sells to a further dairyman, till the poor rejected beasts are finally brought up in the butcher's shambles! And such is the history of every man of the dairy herds in our country—a short-sighted, miserable, unprofitable mode of keeping up a supply of milch cows.

In opposition to this, we would propose a different plan. Having selected the best herd of cows we could find, instead of getting a wretched inferior bull, with just vitality enough in him to beget a calf, as the means of enabling the cow to produce her yearly supply of milk, and then destroying the calf soon after birth, we would select a bull of some distinct milk-producing breed—and that breed should be of a kind fitted for our own soil and climate. This bull should be descended from a good milking dam, and also from a sire whose ancestors were of a good milking tribe, if possible. A close examination into these facts would give the bull a pedigree, of course, which we would demand. In addition to his milk-begetting qualities, he should add those of good shape, fineness, and general quality peculiar to his breed. We would preserve the heifer calves by this bull from the best cows, and rear them to keep the number of our cows good, as the calves grow up and the cows are worn out or displaced. According to the general physiological rules of "like begetting like," our young cows would nearly all turn out the first class of milkers. We would educate the calves to the developement of their best milking faculties, thus: They should be *well fed*—not pampered; allowed plenty of new milk for the first month, then gradually led off into skimmed milk, or oil meal, and be kept all the while in a sweet grass pasture. At four months they would be fit to wean. From that time forward, pasture in good grass until winter. Through the winter, soft sweet hay, and perhaps a quart of oats, or half the quantity of Indian meal a day, until grass in the spring. Then good grass pasture another summer, and hay through the winter. At two years old, grass again for the summer, and turned to the bull in July—even her own sire, if he has proved a good getter, for such close breeding is not hurtful for a *second* generation. The young cow then comes in a finely developed beast, and being gentle and docile, as she would be if properly treated, she furnishes a fine milking cow, perhaps a little extra cost, but one which, in the natural order of things, is worth one-and-a-half, or two that can be obtained out of a common drove for dairy use. Three or four good heifer calves thus raised every year by an intelligent dairyman, will well keep up his herd of twenty cows, and in that proportion for a smaller or larger number.

As a proof of the advantage of thus breeding up a herd of dairy cows, the writer would relate his own experience: Many years ago we kept a milk dairy for supplying the town people near by with milk. Our herd was a mixed one of different breeds—Short-Horns, Devons, and Natives, with intermediate crosses, and grades. We selected two compact, well-made bulls—one Short-Horn and one Devon, pure in blood, each of his kind. To the pure bred cows of each breed, we bred the same blooded bull, and crossed them upon the grade and native cows, as we judged best to effect our object of producing milkers. Our thorough bred calves of each breed, we of course raised, and selected the most promising of the grade heifer calves to raise for future dairy cows. In the course of our opperations we bred and reared about sixty heifers, and with *one* exception only, when they came into cow's estate, every individual turned out a superior milker, with fine form, and excellent quality of carcase as well.

But we will give the sequel. After some years continuance, not because the business was unprofitable but because we could not give the personal attention to it that it required, we discontinued the occupation, and sold off the most of our herd, chiefly grades —a part of them at public sale. Coming in as they did, at different seasons of the year to give a *regular* supply of milk as far as possible, our cows were in different conditions as to flesh. The full milkers were in moderate flesh; the dry, and nearly dry ones were in excellent condition. As they were put up to be sold, since every buyer wanted "a first-rate milker," the question as to her milking quality was asked of each one when offered. There was a difference, of course, some better, some not equally good. Yet, no matter what the answer might be, the *fattest* cows, in every instance, *brought the most money!* So much for the eye, over utility!

But many dairymen say they "cant afford to raise their cows. It is cheaper to buy them, and run the chances." *We* do not believe it—at least, as the *chances* run within our own experience, and observation. It may be objected, and with considerable truth, we admit, as in the late examples, that the Short-Horns and Devons are not milkers. To this we reply, that they are *naturally* good milkers; but the modern breeders have bred for flesh, and symmetry of shape, chiefly, and in striving for these have measurably bred out, or sacrificed the milking quality. But the milk can be brought back again by breeding. That quality is still latent in the animal, and use and education will restore it in the manner we have indicated. Still, we are not advocating *breeds* of cattle, we speak only of selecting good dairy cows, and perpetuating their best milking qualities in their descendants.—*Am. Agriculturist.*

The Farmer's Motto.

Gen. Bierce, closes an Agricultural Address at Twinsburgh, Ohio, Sept. 17th, 1857, as follows:

"Let the farmer's motto be, then, 'good farms, good stock, good seed, and good cultivation.' Make farming a science, in which your head as well as your hands are employed; let there be system, reason, in all your operations; study to make your farm beautiful, and your lands lovely; entice, by kindness, the birds to visit, and cheer your dwellings with their music; I would not associate with the man or boy that would wantonly kill the birds that cheerfully sing around our dwellings and our farms; he is fitted for treason and murder. Who does not, with the freshness of early morning, call up the memory of the garden of his infancy and childhood? the robin's nest in the cherry tree, and the nest of young chirping birds in the currant bushes; the flowers planted by his mother and nurtured by his sister? In all our wanderings, the memory of childhood's birds and flowers are associated with our mother and sisters, and our early home. As you would have *your* children intelligent and happy, and their memory in after life, of early home, pleasant or repulsive, so make *your* farms, and *your* children's home."

Manures for Pears.

During the late Pomological Convention, held at Mozart Hall, New York, we were much interested in observing the appearance and quality of pears there exhibited. We have long known that all kinds of pears flourished with us when supplied fully with soluble phosphate of lime and potash, and that even the Napoleon, so generally discredited, always succeeds most fully under such treatment.

Among the fruits exhibited were a number of specimens from the garden of Dr. Boynton, of Syracuse, New York, who is now lecturing on Geology at the Cooper Institute. These pears were of superior quality, having a peculiar wax-like surface, and surpassing in color all others in the exhibition. Our attention was called to these pears by Dr. John A. Warder, of Cincinnati, who informed us that the manuring was said to be special, but he did not know the precise treatment. To-day Dr. Boynton paid us a visit at our place, and we had the pleasure of a long conversation with him on pear culture. He states that he believes the entire superiority of his pears to arise from the fact, that he has used the superphosphate of lime and potash freely as fertilizers, with full underdrainage and thorough deep disintegration. He states that although his garden is 180 feet above the level of the surrounding country, and is a free, dry soil, still he underdrains, and thus secures a full and efficient aeration of the soil, and perfect security against drought. All this fully accords with our practice, and we are glad to know that the best colored pears we ever saw, were fertilized in the manner we have so often recommended, and on soils prepared similar to our own.

We hope Dr. Boynton may be induced to make public all the facts in relation to the methods he has pursued in producing the unequalled specimens we have referred to. Their beauty certainly excels that of any other specimens we have ever seen, and the methods, so far as detailed to us by the grower, fully endorse the doctrines we have so long advocated. Until Napoleons and other pears of generally admitted doubtful success shall be grown equal to ours without the use of super-phosphates and potash, we shall claim as a truth, that such special fertilization is superior to the ordinary practice of ordinary cultivation of the soil by surface-ploughing alone and the use of farm manures.

We would again remind our readers, that a saturated solution of soda applied to the bodies of pear trees, will remove the louse and scale perfectly, by a single application.

[*Working Farmer.*

An Old Farmer's Note Book. Why Sows Destroy their Young.

I have always kept breeding sows, and in early life met with many vexatious losses from the sows destroying their pigs. Common sense told me that this was caused by some treatment by which man thwarted the designs of nature, as in the natural state animals may be left in safety to their instincts, of all which the strongest is love for their young. This led me to study hogs closely during the latter period of pregnancy, and watch all their ways up to the time of pigging. I also noticed my neighbours' treatment of their breeding sows, and by comparing results, I learned what caused this danger, and how to guard against it.

Costiveness and its accompanying evils is the main cause of sows destroying their young—and proper food is the preventive and cure.

I have never known a sow to eat her pigs in the autumn, when running at large with plenty of green food; but with hardly an exception, sows littering early in the spring are troubled with costiveness, which is frequently so severe as to be accompanied with inflamed eyes, great restlessness, and other signs of suffering. This restlessness sometimes increases till it amounts to frenzy. I have had them become so savage as to attack me fiercely, though at other times perfectly gentle If not stopped, this frenzy may increase with the pains of labor, and the sow will then destroy her young, or any other living thing within her reach. Cure the costiveness, and this restlessness and irritation will be cured, and if she was a good natured sow she will become gentle and quiet again.

Green food is the cure. As it is usually scarce at this season, you ought to provide for the emergency by saving roots to feed to them. Formerly I used potatoes for this purpose, but since the potato rot commenced I have used sugar-beets, and always have some on hand to feed to my sows for several weeks before they come in. They are very fond of them, and eat them greedily raw. A half peck or more a day with but little other food will keep a sow in the finest condition. Potatoes are as good, and carrots, parsnips, mangold wurtzel, or turnips will do, but it may be necessary to boil them and mix them with other food. If you have no roots of any kind, you must resort to sulphur and give a large tablespoonful two or three times a week for several weeks before littering. Give also a little charcoal occasionally, and always be kind and gentle with them, and they will never attempt to kill their pigs.

A common mistake is to move the sow to another pen shortly before she litters. This is very irritating to her. She should be separated from the others and moved to her new quarters several weeks before her time is out. She must be kept sheltered, and a week before she litters supplied with all the straw she will want, which will be better for being short. After this her nest must not be molested, and she ought not to be disturbed in any way, as it is the nature of all animals to seek privacy at this period. Hogs are more true to their time than other animals, and rarely vary more than a day or two.

But if you want to be sure to lose your pigs, feed your sow on corn and cob meal. This will make her very costive, if fed without much other food. Then when she is sick and feverish, and consequently cross, irritate her yet more by driving her from the nest she has become accustomed to; then let the boys teaze and abuse her every day, and if the poor maddened animal does not destroy her young as fast as they are born, it will not be your fault.—*Homestead.*

Why Use Cut Food?

An intelligent farmer asks for the philosophy of cutting hay. He can understand that it is useful to cut corn stalks and coarse fodder, because cattle will eat it better. But when the cattle will eat good English hay perfectly clean, why should it be passed through the hay cutter?

Our friend evidently supposes that the stomach does its work upon everything that passes into it, with equal facility, and without any tax upon the rest of the system. This is manifestly an error. All food has to be ground up before it can be assimilated and pass into the circulation of the animal. If food is not artificially prepared by cutting, grinding or steaming, the animal has to prepare it himself so far as he is able. Certain kinds of food will pass through the system, imparting to it only a part of their nutriment, because the teeth of the animal have not perfectly masticated it. Whole kernels of corn or of oats are often seen in the fæces of an old horse.

The more perfectly food can be prepared, the more completely will the system appropriate its nutriment. If the whole labor of grinding up the food is thrown upon the animal, it is a serious tax upon the vital energy which every good farmer wants for other purposes. In the case of the horse and ox, you want the strength applied to locomotion and draught.

Whatever strength is applied to grinding food, is so much taken away from their capacity for labor. If three or four hours of strong muscular labor are spent in working up hay or straw into a pulp, there is a great loss of strength and of time.

In the case of fattening animals, you want the aliment to go to the formation of fat flesh. This process goes on successfully, just as the animal is kept quiet and comfortable. No useless labor should be expended in the grinding up of food. The straw cutter, working up the hay into fragments of half an inch in length or less, performs a good part of the working of the jaws, and makes the feeding of the animal still a light matter. If the hay could be ground up into a fine meal it would be still better; as it would make the work of the animal still lighter, and would more completely yield up its nutriment. If it could be steamed it would be best of all, as it would then be wholly appropriated.

We have no doubt that it pays quite as well to pass hay through the machine, as the coarsest fodder. A root cutter is also an indispensable adjunct to the barn, and the more perfectly it communicates the roots the better.

The farmer who has ever experienced with these machines, and marked the results of feeding with hay and roots prepared in this way, can have no doubt of their utility. Laziness, we apprehend, has quite as much to do with these machines as ignorance. It is work to turn the crank to cut up hay enough to feed twenty head of cattle; and in prospect of spending the elbow grease, it is very convenient to believe that it will not pay. Sloth, however, is a poor counsellor in this case, as in all others. We should as soon think of feeding them with uncut straw. A warm stable and a strawcutter are both good investments.—*Goward's Register.*

From the "La Grange Reporter."

Mr. Editor:

Accept my compliments, and find on this paper two receipts, which I regard as invaluable to farmers and all others who own mules and horses. I have tried them myself on some very fine blooded animals, and have caused them to be tried on others, and never knew them to fail as cures. As a citizen of La Grange, I recommend them to its people, and to the surrounding country, as infallible remedies to accomplish what I claim they have often done, and will invariably do, when judiciously, or rather correctly, administered.

For Curing and Preventing Botts in Horses or Mules.—Take 3 papers of smoking tobacco, rub to powder, and sift well: 1 lb. of black antimony; 6 ounces of powdered fenugreek seed—this last will be found only in wholesale druggists' establishments:—and one peck of strong, well sifted hickory ashes. Mix the whole in an air-tight box, by first putting in a layer of ashes—say one and a half inches deep—and then a tea-spoonful or two of each of the other ingredients, and so on, alternately, until all are thoroughly mixed. Keep the box air-tight. Give a horse or mule from one and a half to three table spoonsful, three times a day, spread on his corn and sprinkled with water until damp. Three or four day's time is sufficient to cure a horse or mule of botts; and about the second day the botts commence exudating from the animal in great exuberance. And now the close observer of the race of animalcules may become sublimely fecund and tediously elaborate upon the important science of horseology. But by continuing to give this medicine for a few weeks, the general health of the animal will be greatly improved. If the medicine acts too freely on the bowels, lessen the dose. This composition, given to horses and mules according to my directions, for two or three months of November and May, will successfully save them from ever dying from botts.

Remedy for Renovating an Old Horse.—Take a handful of rue; 1 handful of the root of Jerusalem oak; 1 ball of garlic, the size of a guinea egg; a piece of tobacco, from the end of a twist, say two inches in length; and a piece of saltpetre the size of a pea. Mix all, and boil in one and a half gallons of water, until the water is half reduced; then strain through a cloth; fill three quart bottles, and drench the animal for three successive mornings, before eating or drinking. This medicine acts on the bowels, cleanses the system, purifies the blood, and gives to the hair a rich, glossy appearance, and in a few weeks, with good attention, will make an old or poor horse sleek, fat, strong and supple. If the saltpetre is used, keep the horse or mule dry one week; if this is impracticable, leave out the saltpetre.

Respectfully,
John Wiley Cook.

From the Philadelphia Enquirer.

Integrity.

"I've scann'd the actions of his daily life
With all the industrious malice of a foe,
And nothing meets mine eyes but deeds of honor."

We sometimes hear complaints on the part of the high-minded and honorable, in relation to the apparent success of villainy. They cannot understand how it is that in the natural course of things, and with an all-wise Providence overseeing and superintending, merit is so frequently found to languish in obscurity; to experience misfortune, and to realize indigence, while the bold, the unscrupulous, and the guilty, are permitted to attain wealth, influence and power. They argue that this condition of affairs is calculated to discourage, and in fact, to constitute a premium for vice and crime. But this is a short-sighted view. Only a portion of the drama of life is realized. The sequel is yet to take place. The ways of Providence are often mysterious, and to the finite mind and eye, incomprehensible. Guilt may prosper to-day; trick, guile, and fraud may acquire position and power, yet these will prove but temporary. The future is yet to be revealed. However, therefore, tempting and dazzling the apparent success of crime—however some skilful, polished, and plausible trickster may contrive to defraud and victimize his friends and neighbors, a day of reckoning will come at last, when the responsibility will be of a truly terrible character. The history of mankind is full of illustrations. They may be found in every walk of life. Crime carries with it its own penalty. It is impossible, even for the most hardened, to stifle the still, small voice of conscience—to make the memory oblivious, or to deaden the mind and the heart to recollections and reflections upon the past. Integrity is, after all, one of the highest and noblest of virtues. It is god-like in its nature and its attributes. It purifies, it elevates, and it adorns. Misfortune may come, friends may forsake, storms may burst, but if a consciousness is felt within that duty and principle have been adhered to at all times, and on all occasions, an inward sense of satisfaction, of courage, and of hope will be felt, which nothing in this world can take away. The man of integrity is true, not only to himself and his conscience, but he is equally so to his friends, his neighbors, his associates, and all with whom he may hold converse or have dealings. Such a man, moreover, can never be wholly depressed or overwhelmed. His character is priceless, and it will win for him respect, even amidst the keenest ill of poverty, and confidence even from those who have wronged him. What can be more valuable in an extensive establishment, where there are many trusts of importance, matters of confidence, and cases of privacy, than a man of strict integrity—one who can be relied upon under all circumstances, and in whose soul the element of truth, honesty and honor are so admirably interblended, as to form a deathless union. The quality of unswerving integrity is the more to be prized and appreciated, because all are surrounded by temptations. All, moreover, are weak, fallible, and to some extent, selfish. When, therefore, amidst the various chances and changes that take place in commercial and monetary life, when in storm and in sunshine, in poverty as in prosperity, we observe an individual still maintaining, upholding, and preserving his integrity, willing to perish rather than resort to a dishonest act, we may still imagine and contend that a sympathy exists between the mortal and the immortal, and that the divinity, so to speak, lives and breathes within the heart of man. It sometimes happens that in the excitement of the battle of life, in struggling forward amidst the shoals and quicksands of adversity, every thing like hope sinks within us, and in the subtle fiend of temptation whispers and persuades to some acts of treachery and dishonor. A mocking story is told, a false future is painted, and a single act is described as calculated to resuscitate for the time, and to outspread a glorious prospect. But alas! that act may be one of turpitude or crime. It is then that integrity exercises all its moral force, that "the better nature" rises above the inferior, that the temptation is resisted and the triumph achieved. But for this principle, a momentary change would have been realized; and then regret, remorse and sorrow, and shame, would have followed and with fearful rapidity. The poor wretch who deceives himself with the delusion, that dishonesty is the policy, even for this world, that he can utter falsehoods, commit frauds, indulge in hypocrisy, iterate slander, and all with impunity, commits a fearful, nay, a terrible mistake. Sooner or later the retribution will come. It may be postponed for a month, for a year, or for ten years, but then, even when least expected, then, when all looks bright and beautiful—then, when the wronged have been forgotten, or have passed to their last long sleep of death, some incident will occur, some development will take place, and the avenger will strike with all his strength. This may be regarded as certain in the great multitude of cases. It is not for man to follow them up to their close, but they cannot escape the All-seeing Eye—they cannot avoid the Ever-present Hand. In every sense, therefore, integrity is the true policy. It is the policy to live by and to die by. That noble virtue—that lofty quality preserved amidst every evil and every change, and man will in some degree assimilate to God, hope for and aspire to a blissful, a beatific, and an eternal destiny.

The Imperial Stables of France.

The Ayer Observer, in giving an account of the French Imperial Master of Horse, thus describes the Imperial stables and their concomitants:

At the royal stables may be seen no fewer than 350 horses of the finest breeds, including the Emperor's favorite charger, Philip, a splendid dark brown animal, of the most perfect symmetry, to which the Parisians attribute qualities more than equine. They tell that before the emperor was called to the thorne, he was one day riding his horse at a review, and on passing the royal flag, which is wont in France to be lowered by way of saluting members of the regent family, the creature stopped, as if entitled to receive the usual demonstration of respect, as if conscious that it bore on its back the future sovereign of France! There are 275 carriages including the state carriages —the latter of which are very gorgeous; one of them which our Queen rode in on the last occasion, should it happen to be used on a wet day, would cost nearly £1,000 to regild it.

There are three of these at the stables at the Tuilleries, and three at Versailles. There may also be seen at the Paris stables, the saddles presented by the Pasha of Egypt to the Emperor and Empress valued at $10,000. The Empress has used her's only on one occasion. There are 260 men employed in the stables all the year round, whose wages alone cost £60,000, apart altogether from the current horse flesh expenses. The stalls of the horses are all arranged in compartments, the stall of the highest horse in each occupying the centre of the compartment, the others ranging in the order of their height on either side, giving the whole the appearance of a series of mathematical diagrams pleasant to look at for their regularity. The royal carriages are arranged in a similar way. The cap and sword of the late Napoleon, and a portion of his uniform, are carefully preserved and shown at the stables.

Strive to recommend religion by the courtesy, civility, and corresponding character of your conduct.

AN ESSAY
ON
Horizontal Plowing & Hill-Side Ditching.
BY
NICHOLAS T. SORSBY, M.D., *of Alabama.*

The author of this interesting Essay, (who retains the copy-right in his possession.) has kindly permitted us to transfer it to our columns, from the Transactions of the North Carolina State Agricultural Society.

A premium of $50, was awarded by the Society for this Essay.

PREFACE.

This Essay was written in compliance with the demands of the North Carolina State Agricultural Society.

The writer having felt the need of such information, in days past, feels he would be uncharitable and ungrateful to withhold, and not impart his knowledge on the subject, to his brother farmers.

He has endeavored to serve them in a feeble manner, in a matter deeply concerning their pecuniary welfare, and tried to arrange the subject in a systematic form, and explain the different methods of the horizontal culture, so that the humblest mind can understand and appreciate them.

Each article is separate and distinct from the others, and yet all are connected together by the general bearing of the subject.

Should this small effort in behalf of the soil of North Carolina, meet with the approbation and requisitions of the members of the Agricultural Society, and receive the careful perusal, study, and application of its principles to the soil, by the farmers and planters of the State, the writer shall feel that his labor is not lost and his talent not buried in oblivion.

INTRODUCTION.

It has been but a few years since the subject of this Essay was brought to the notice of the American farmer.

It now occupies an important and prominent position among the scientific operations of the Southern Farm.

It may be considered as a new branch of agricultural science, founded upon correct and well established principles of the sciences of Engineering and Hydraulics; and essential to the welfare of the farmer, to the preservation of the soil, and to good husbandry.

Forced, almost by necessity, and the strong sense of self-interest and foresight, a few intelligent minds have been brought to discover the urgent need of reforming the old destructive system of plowing in straight rows up and down hills, and of substituting the better mode of horizontal culture.

The absurdity of the old method is really a subject of astonishment and mortification, to those who practice the new methods. The arable lands of the South have been nearly exhausted by it and a careless and wasteful culture.

The beauty and simplicity of the principles and practice, as well as the advantages of the new methods, can only be realized and brought home to the farmer and planter, by observation, study and practice, and when once understood, they will wonder at their past folly of land-killing, and grieve to know they practiced it so long, when a different and better system is so easily learned and pursued.

When we reflect upon the disasters to the soil, occasioned by the pursuit of the old method, and see the apparent apathy to, and indifference with which the more perfect and better system is viewed by some intelligent farmers and planters, at the present enlightened era and golden age of agricultural science, we feel alarmed for them, for their lands, and the succeeding generations.

What a poor inheritance to hand down to an industrious son, an old dilapidated homestead, with an old worn out, galled and gullied farm! Think of it, farmers and planters!

The very sight of decay all around, excites in the mind of the young man, disgust, despair, a disposition to abandon the old place, once so dear to him, and the family, now so much abused, and seek a newer and better place, richer land, among strangers. He has no desire to cultivate the worn out old-fields, and perhaps there is no new land to clear. The old method of plowing up and down hill, has much to answer for; it has driven many a young man to the South-west, and perhaps, eventually, to prison, or the gallows, who might have been a useful citizen, could he have remained at home, and made a living.

Whilst the *horizontal culture* and the *ridge* and *furrow system* are attracting the attention, and being adopted by the intelligent planters and farmers, its principles must be studied scientifically and practically, and new discoveries in the art applied, tested, and settled in the minds of men, or else there will be no end to the diversity of opinions that may arise, and lead to discussions that may retard the advancement of the new science.

It would require much time and space to elucidate the different methods of the horizontal culture, as fully as some men may desire, perhaps.

We have endeavored to simplyfy it, and should some of our readers not comprehend it perfectly, all that we can say to them is, study the principles laid down here, and then take the *level* and follow the plumb, and it will lead them over more tortuous and obscure lines than we have penned here, and a few horizontal rows run with patience and care, will teach them more about it than was ever dreamed of in our philosophy.

Our aim has been, in writing this Essay, to collect together our ideas on this subject, to compare them with others, and deduce from them correct principles, and upon these principles establish with fidelity, practical rules, and thus accomplish by a general survey of the subject, and a brief enumeration of the details founded upon our own experience and observation, all that we think the State Agricultural Society of North Carolina requires of the writer.

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HISTORY OF HORIZONTAL CULTURE.

We regret to state that we have not been able by a careful research of all the Agricultural works that we have been able to examine, in the English and French languages, to find the origin of this system of culture.

Mr. Thomas Jefferson, who was a close observer of improvements in Agriculture, in a letter dated "Monticello, 6th March, 1816," says, "My son-in-law, Colonel Thomas M. Randolph, is, perhaps, the best farmer in the State; and by the introduction of the Horrizontal method of Plowing, instead of straight furrows, has really saved this hilly country. It was running off in the valleys with every rain, but by this process we scarcely lose an ounce of soil.

"A rafter level traces a horizontal line around the curve of the hill or valley, at distances of thirty or forty yards, which is followed by the plow; and by these guide lines the plowman finishes the interval by his eyes, throwing the earth into beds of six feet wide, with large water furrows between them. When more rain falls than can be instantly absorbed, the horizontal furrows retain the surplus until it is all soaked up, scarcely a drop ever reaching the valley below.

"Mr. Randolph has contrived also, for our steepest hill-side, a simple plan which throws the furrows always down hill. It is made with two wings welded to the same bar, with their planes at a right angle to each other. The point and the heel of the bar are formed into pivots, and the bar becomes an axis, by turning which, either wing may be laid on the ground, and the other then standing vertically, acts as a mould-board. The right angle between them, however, is filled with a sloping piece of wood, leaving only a cutting margin of each wing naked, and aiding in the office of raising the sod gradually, while the declevity of the hill facilitates its falling over. The change of the position of the share at the end of each furrow is effected in a moment by withdrawing and replacing a pin."

It seems Colonel Randolph introduced this method of plowing into Virginia, previous to 1816, as Mr. Jefferson states, he was acquainted with it two or three years previous to writing this letter.

This is the earliest notice that we have seen of the use of the horizontal culture, as practiced in the South at the present day. It would be gratifying to know from whence he introduced it, and where it originated.

In "Taylor's Arator," published in Virginia the beginning of this century, on the subject of plowing hilly lands, it is stated "that such lands will admit of narrow ridges, as well as level, by a degree of skill and attention so easily attainable, that is has existed in Scotland above a century past under a state of agriculture otherwise execrable, and among the ignorant Highlanders. It is effected by carrying the ridges horizontally in such inflections as the hilliness of the ground may require, curved or zigzag, preserving the breadth. The preservation of the soil is hardly more valuable than that of the rain water in the successive reservoirs thus produced to refresh the thirsty hill-sides, instead of its reaching to and poisoning the valleys."

It is very strange, if this system was pursued in Scotland so very long ago, that there is no mention made of it in English works.

During an extensive tour, and residence of over three years in Europe, from Great Britain to Naples, Italy, through Holland, Belgium, France, Switzerland, and parts of Germany, we never saw, heard or read of its being pursued in any of those countries, as it is done here, and we cannot conceive how it could have ever been practiced in Scotland and not kept up now-a-days.

In our travels throughout the United States, we have seen it pursued from Mississippi to North Carolina. We have been to Monticello, several times, when a student at the University of Virginia, and though remarking the productiveness of the soil there, and around Charlottesville, we were too young to notice the mode of culture, but we are sure we never saw a rafter-level or any other level applied to lands in Virginia. Had we seen it, we should have noticed it, because we had followed it before we went there to school, in 1836.

In "Thair's Principles of Agriculture," a standard German work, in speaking of plowing ridges, he says, "the most advantageous disposition of them that can be made on an inclined surface, is to give them a horizontal or standing direction;" but he says nothing more on the subject. Had he been acquainted with the method as pursued in the South, he would have written considerably on it.

We are inclined to believe the horizontal system of plowing is of Southern invention. We are astonished at the fact, since the Southern planters and farmers have the reputation of being such careless and wasteful cultivators of the soil.

We consider it the most important discovery of the modern agricultural era. So important is it to the South, and to the soil in every part of the world where it rains like it does here, that the discoverer of the method deserves the lasting gratitude of the Southern people, and a place upon the tablet of memory next to that of the father of our country.

Hill-side ditching and guard-drains, were discovered subsequent to the origin or introduction of the horizontal system into Virginia. They were first introduced into that State soon after the introduction of the horizontal method, about 1815 or 1816; by whom, we do not know.

The first written notice of the horizontal culture and hill-side ditching that we ever saw, was in the pages of the "Southern Cultivator." Major E. D. W., our step-father, first introduced the method of Horizoltal Plowing on the level system into this county, in the spring of 1834. He had read a notice of it in some paper, which induced him to try it on some hilly land at the Dial Place.

He used the rafter-level and plummet-line, and ran off rows to be plowed four feet apart into beds for corn and cotton. I was a boy then, and carried the hoe and made the chop marks for him. He was so well pleased with the results of it, and with his experiment, that he has continued it ever since with great success on two plantations. He has a thousand or more acres under the plumb. He has tested it thoroughly, and has preserved the fertility, retained the soil, and improved his lands, aided by a proper application of manures, under a severe course of cropping. Without this system, all the manure he could make would not preserve half of the land in its present state of fertility for five years. He would as soon abandon planting as to abandon the horizontal system of culture.

We have assisted him in the work a good deal, and induced him to try guard-drains and hill-side ditches about 1851 or 1852, in order to lighten his labor and lessen his care and attention to it, as he is getting old and the confinement to the field and exposure to the cold during the winter and spring are injurious to his health. But, he says, he could dispense with the drains and ditches if he could attend to the plowing in person every spring, and direct the work and correct the errors of the previous year's work.

An old negro horizontaler lays off the rows, and attends to one plantation where there are between six and seven hundred acres under the plumb; and manages it astonishingly well for a man of his understanding.

His lands were originally of a good quality, and are of a mixed character. On one plantation, the grey and mulatto sandy land prevails, the subsoil being yellow and red clay a foot, and eighteen inches originally, in parts of it, beneath the surface soil. The balance of the land is a chocolate loam on a red clay subsoil. Some of it is considered stiff red clay land. On the other plantation, the chocolate loam prevails with a close, stiff red clay subsoil, requiring a long and sharp-pointed plow to penetrate it when moderately dry. The rest of the land on this plantation, is grey and gravelly sandy soil, loose and porous. Most of the land on both places, is gently undulating ridges. Some of it is hilly, and some knolls. The stiff red clay land is the most difficult and expensive to cultivate, and is the best land for grain. It is also the most difficult of his land to manage on the level method of culture.

I took my first lessons under him in the science, and owe him a debt of gratitude which can never be paid. He taught me the level culture, and I taught him the grading method. I commenced planting in 1844, in Hinds county, Mississippi, near Jackson, in copartnership with a brother. The *level culture* No. 1, and the *grading method* No. 1, both combined, without drains and hill-side ditches, had been in use a few years on that plantation. The soil, a close, tenacious, marly clay, of a yellow color, changing into an ashy colored soil, when thoroughly disintegrated and cultivated a year or two. I was partial to the level culture, and he to the grading method. I found out, after a better acquaintance with the land, that the level culture retained the water too long, and made the land too wet for cotton. The grading method drained, but washed the land a good deal. After testing both methods to my satisfaction, I gave into his views rather from an avaricious motive than otherwise, to make better crops, though at a sacrifice of some land that took the streams and disappeared. From one to three inches fall were given to each row, when practicable, and the short inside rows plowed on a level. The land was rolling, and drains between the ridges conveyed the water into ditches and branches. We continued both systems until I left in December, 1850, and moved back to this place. The grading method has been kept up by him. I commenced a mixed system here in 1851, and have practiced both of them to a certain extent.

My land is chocolate and grey sandy land, on a red and yellow clay subsoil. The grey land is of a fine texture, and much of it runs together and bakes. The chocolate land is loose and porous. It is generally a little undulating, some rolling, and some flat basins and ponds. It requires much ditching and surface drainage, and some under-draining. Forest growth, pine, oak, hickory, chestnut and poplar, with a variety of undergrowth.

My experience and observation teaches me, that the *level culture* is the best method ever discovered to prevent arable land, of the majority of soils in the South, from washing by rains, but not the best always to secure good crops. The grading method is the safest as a general rule for the culture of cotton, and can be pursued to great advantage on many soils that could be cultivated well on the level method, when one is willing to lose a little soil to make a better crop, by draining the land. No one system of culture is, then, applicable to all soils; and on large plantations of mixed soils, both the level and grading systems should be applied. He is a fortunate man who understands the different methods well enough to apply them to the best advantage to the different soils, on a large plantation. It requires close application to field study, a good knowledge of the geology of the soil and the agricultural character of the land, with years of experience, to know how to cultivate land to the best advantage to the soil, and to the increased size of the purse.

SECTION I.

Definition of Horizontal Culture.

Horizontalizing, Circling, and Leveling land are different terms employed by *Agriculturists,* in the *South,* meaning all the same thing; viz: cultivating land in parallel lines run by a leveling instrument to direct and control rain-water with the plow.

SECTION II.

Its Objects.

The objects of the System of horizontal culture are, to irrigate, to drain, and to preserve arable soil, in the simplest and most economical manner.

1st. By collecting, retaining, and distributing rain-water, on the surface of arable land, it effects natural irrigation.

2d. By conveying it away, by artificial channels, it effects drainage.

3d. By a proper system of irrigation and drainage, the soil and food of plants are retained, and the fertility of the land is preserved.

SECTION III.

General Considerations.

Rain-water being a solvent of the food of plants, and the medium of supplying them with many of their elements, the system of horizontal culture teaches us to control, and diffuse it in the soil, and distribute it in such a manner that the food of plants it contains, may be made available to the utmost degree, in promoting their growth; and, when it exists in excess, to remove it without injuring, or washing away the soil.

Hence, we conclude that a correct system of manuring and improving land, depends greatly upon a proper regulation of water by the horizontal culture.

We perceive, then, that the horizontal culture is a beautiful branch of the science of Agriculture; that it is a mixed art, a combination of irrigation, drainage, and manuring. We cannot, therefore, study it well, appreciate it properly, and practice it successfully, without some knowledge of agricultural engineering, of the geology of the soil, and hydraulics, and the application of them to irrigation and drainage.

We can then realize and appreciate the several advantages and connections of these branches of science with each other, in developing the chemical and physical properties of soils, and in the improvement of the fertility of land. To practice it scientifically, and successfully, we must study and understand the geological formation, and the agricultural character of the soil, and ascertain by observation and experiment what plants grow on it best, and are most profitable to cultivate.

Drill-husbandry, that is, the cultivation of crops in drills, by the ridge and furrow method, is indispensable, and the check and hill-culture are inadmissible except on level lands, as a general rule, by the system of horizontal culture. Of course, the broadcast mode can be employed, as well with one method as with the other. The horizontal culture, by the ridge and furrow method, conflicts with the practice and opinions of many farmers, in the oldest of the Southern States, who advocate the check and hill culture; but an acquaintance with the horizontal culture changes their practice and opinions.

SECTION IV.

The Different Methods of Horizontalizing land

Are divided into two principal systems, viz:

1st. The Level Method of Culture.

2d. The Grading Method of Culture.

The Level Mode, (or Irrigating System,) is divided into two modes, viz:

1st. Horizontalizing with an instrument, on the level culture, without the aid of guard-drains, and hill-side ditches; and,

2d. The level-culture, aided by guard-drains and horizontal ditches.

The Grading Method, or Draining System, is divided into four different modes, viz:

1st. Horizontalizing with an instrument, giving a grade to the rows, without the assistance of guard-drains, and hill-side ditches.

2d. With a grade to the rows, the same as that given to the drains and ditches, accompanied by guard-drains and horizontal ditches.

3d. With a grade given to the rows so as to empty their water into the drains and ditches.

4th. The straight-row method. The rows run up and down hills, and empty into hill-side ditches.

Besides the above methods, there is the old mode of horizontalizing with the eye, without the aid of an instrument, or guard-drains, or hill-side ditches.

SECTION V.

The Different Methods Explained.

The old method of hill-side plowing by running the rows around hill-sides with the plow, directed with the eye, is mere guess work—of course very imperfect, and only an approximation to accuracy.

It is done with the object of retaining the rain-water in some instances, and of removing it in others; in either case, it cannot effect the object in as perfect a manner as the new methods of level and grade work done on correct principles, by the leveling instrument.

When the object is to retain the rain-water, it answers tolerably well in some countries, on porous, poor, sandy soils, where the showers are not frequent and are light, and where the leguminous crops are cultivated mostly on high beds and lands, as a substitute for artificial irrigation, and where the spade and hoe are used, generally, for the purpose of forming the ridges.

When adopted to drain hill-sides by the plow, unless the soil is not disposed to wash, it is very liable to do more injury to the land by washing it away than benefit by removing the water.

It should not by any means be resorted to now, since we can substitute better methods for it. It is the first step towards the horizontal culture from the straight-row method; and was, perhaps, invented for the purpose of retaining instead of removing water.

1. *Level Culture or Irrigating System.*—By this method the rows are laid off with a leveling instrument on a perfect level, and the land cultivated without the aid of guard-drains, or hill-side ditches.

Here, science steps in to correct the imperfections of the eye.

It is impossible to lay off a level row by the eye. The most skilful horizontalizer cannot judge with accuracy the degree of inclination of lands, and discover all the inequalities of surface well enough to horizontalize land on a level by the eye. But, with a *rafter-level* properly made and adjusted, it can be done, on an even or uneven surface with perfect accuracy, on a dead level: and if the land be properly plowed the rows will hold all the water that falls on them.

It is the best and only system ever invented to prevent comparatively level, and gently undulating lands, from washing.

It is intended to retain all the water that falls on land just where it falls: this is natural irrigation. We all know the value of water for the nourishment of animals and plants. They cannot live without it. Crops often fail for want of it. By this method none is wasted. Enough water is absorbed during winter and spring rains by land cultivated on this system, to almost make some crops, especially when aided by light summer showers, that would fail to do so, cultivated by the grading method. This method is most applicable to all poor, thirsty, porous sandy soils, whether they rest on clay or sandy subsoils; and to many varieties of clay soils not too compact and retentive of water.

We think we may say with truth, that we never knew, in this country, but one kind of clay soil, on uplands, that this system was not applicable to, on the ground of making it too wet for profitable culture. That is the fine, close, tenacious, marly-clay soil, resting on a retentive yellow clay subsoil, of the black-jack, post-oak, and hickory ridges of Hinds, Madison, Yazoo, Carrol, Holmes, Warren, and other parts of Mississippi.

Besides this kind of soil to which the level culture is objectionable, are the compact red and yellow clay soils of some hilly lands, and the blue and white clays of lowlands.

The red and yellow clay lands may be cultivated by it, if they admit of subsoiling to advantage. It is seldom that the level culture is objectionable for corn and small grains, and the root crops. But when it causes the soil to become too wet during the cultivation of crops, to plow well, and hastens a rapid growth of grass and weeds that destroy the crops, it is an evidence that it should be abandoned, and a grading method substituted for it.

2. *Level Culture with Guard-drains, or Hill-side ditches.*—The rows are plowed on a level, and guard-drains, or hill-side ditches are added, with a slight grade to correct the evil of the excess of water, and remove it, should the ridges break. Some soils, such as close tenacious clays, though plowed deep, may absorb a great deal of water during heavy and repeated rains, until the plowed soil becomes well saturated; the water will then sink until it reaches the impervious strata, not broken by the plow, and move along that strata on steep hill-sides, until it accumulates in such quantities as to break the ridges, and flow downhill, carrying the soil with it.

Again, in clay soils, plowed shallow, a heavy rain succeeding another heavy rain, that had caused the land to run together, to be baked by the sun, and its pores to be closed, may cause the water to accumulate in level rows until the volume and weight of water makes a breach, then some of the ridges give way, and the water is precipitated from row to row till it reaches an outlet.

A mole, a stump, bad plowing, the wheels of a cart or wagon, and other causes may break the ridges, and cause the land to wash. To prevent such a disaster, guard-drains,—hill-side ditches have been invented, to aid and protect the level culture, and to correct the ignorance and errors of the inexperienced horizontalizer, and save his time, labor, and soil. But, in many instances, they encourage careless work, and are sometimes of evil tendency. They should not be relied upon too much; the remedy may prove worse than the disease.

1. *The Grading Method, (or Draining System.)*—The great object of this method is surface drainage, of arable land: hence it is divided into,

1st. Horizontalizing with a grade given to the rows, without the aid of guard-drains and hill-side ditches.

Every row is designed to drain itself, and of course the other drains are unnecessary. It is a kind of self-sustaining system, and a substitute for straight rows. It is beautiful in theory, but difficult to practice, as a general system, on all soils. In some fields, and parts of fields, no grade is necessary, whilst in others different grades are required according to the inclination of land, the physical properties of soils, and the length of rows. The length of rows is very irregular by this method, and short rows emptying into long ones, pouring their water into them, force them to wash into gullies. Hence, it is impossible to prevent the soil from washing by this method. It should be confined, therefore, to close clay soils. This method answers best combined with level culture.

2d. *Horizontalizing with a grade given to the rows* the same as that of guard-drains and hill-side ditches. This method was adopted, doubtless, to correct the evils of the preceding method.

When the drains are well made, they check the flow of water descending down the hills from the broken rows, and thus convey it away and protect the land beneath them. Without their aid much mischief might take place, but if the work by the preceding method be well done, there is no need of the drains to aid it. Imperfect work, then, excuses their employment. But they are indispensable evils to the system they are used to protect, and are much employed.

3. *Horizontalizing with a grade given to the rows* so as to empty their water into guard-drains and hill-side ditches.

This is truly a draining process, employed on clay-uplands, and low-lands, and answers a good purpose when the rows are not too long, and the fall is correct. Of course the drains and ditches require considerable fall, and to be very capacious. It is popular with those planters who have clay soils, and trust much to overseers and negroes, and kind Providence for gentle showers, to make them crops. But overseers make mistakes, plowmen do bad work, and the clouds pour down heavy rains, and the soil, as it were, melts and runs rapidly away. To answer a good purpose, the overseers, plowmen, and drains require strict attention, or the land will be injured by this method.

4. *The Straight row Method, with Hill-side Ditches.*—The ditches in this instance are cut on hill-sides with considerable fall, and the land is plowed on the old straight-row method, the plowman raising his plow over the ditch banks as he passes them. It is evidently a troublesome business to raise the plow over the ditches, and keep them clean. If the soil be sandy, and disposed to wash, the ditches must be deep and large, the fall great, and the plowman careful, which is contrary to negro character, or else every heavy rain will fill up the ditches with sand, break their banks, and cut the land into gullies and galls. However, it has the recommendation of being simple, and better than the old up and down hill method, without the protection of ditches.

Experience will soon teach any one that it is a bad system for hilly lands: for low-lands, it answers a good purpose for quick and effectual drainage, and enables some low-lands to be cultivated that could not be without this kind of drainage.

On the rich low wet lands, and the rolling up-lands, in the prairie or lime lands of Alabama and Mississippi, when too wet, this kind of expeditious drainage is the *sine qua non*,—the proper method to remove the water, and dry the land in time to prepare it for a crop, and to save the cotton from damage by excess of water.

SECTION VI.

Philosophy of the Level Method.

It is true there are deep, sandy, alluvial soils that absorb all the water that falls on them during the heaviest rains; but, again, there are other soils, when cultivated on the straight-row method, that are injured by the irregular distribution of water, one part of the field being drained too much, whilst the land below it is being drowned; thereby, both parts sustaining an injury. The crops on such land grow and mature irregularly as the consequence. The level culture corrects these evils. It retains the water and soil in their proper place, and when the land is cultivated alike, all remains nearer the condition of dryness, and the crops grow off more uniformly on the same quality of land and mature nearer the same time.

Should the land be manured, the elements of the manure remain where deposited, and are not removed by the first rain to the nearest ditch or branch. It irrigates and preserves the soil, when properly done. It is the best method to employ to aid in restoring exhausted lands.

It is very difficult to lay down any set of rules by which to do the work; because, the physical properties of soils are such, and the inequalities of land vary so much, no one rule or set of rules would apply to any great extent of surface. One part of a field might require the level culture, and another part the grading method. Hence, we are forced to adopt the one or the other, according to circumstances, and to do the work correctly, we must be acquainted with all the different methods.

It matters but little where the work begins or terminates in the field, so the rows are laid off accurately, on a level. The most important rule is to follow the level, let it lead to whatever point it may. It will run at every point of the compass, and form rows of every imaginable form and length, terminating wherever it may. It will lead the new beginner in the art into a maze from which he can scarcely extricate himself, but he should have patience and perseverance, and all will come out right and no land be lost. He must be content to follow the level, but not try and make it follow him, and force it to any particular place or termination. The only way to terminate a row at a certain point, is to start the level at that point: but ten chances to one, in returning, if the next row does not go off at an angle, and terminate at some distance from the first starting point. It is immaterial whether the rows be long, short, straight or crooked, or where they begin and terminate, so they are on a level, and the land be well plowed in rows or ridges. This should ever be borne in mind. The horizontalizer will make mistakes, and be awkward at first, but will learn to do the work correctly.

SECTION VII.

Advantages of the Level Culture.

This system is the best mode of cultivating land ever invented, to prevent the devastating effects of rain-water washing away the soil and the manures put upon it. It enables the soil to absorb more water, and retain it better, and give it back to plants when needed, more effectually and regularly than any other mode, thus preventing the deleterious effects of drought. It makes the soil more uniform in production; improves its fertility by retaining the manures; makes it easier to work, with less labor; causes the crops to grow faster, to be more uniform in growing and maturing; and as the rain-water is evenly distributed on all parts of the field alike, so that when one part can be plowed, all can be done at the same time; saves time in turning around at wet land.

Disadvantages of the Level Method.

It seems in the order of things in this world, there is an evil attached to almost every good. So it is in this instance, but we shall find that the disadvantages are overcome by practice, and are counterbalanced by the advantages.

The disadvantages are, the unavoidable necessity of having so many short rows terminating at any part of the field, forcing the plowman to turn around often, and lose time by so doing:—(this time, however, is made up in the greater number of long rows:)—The injury to the crop, done by the plow, the mule and the hand, in turning around at the end of the short rows: The difficulty at first of doing the work well, and of plowing the rows out without breaking up the work and deranging the rows: The constant care and attention, by the overseer or employer, to maintain and keep up the system. And the necessity of using the ridge and furrow system and abandoning the check and hill culture.

[TO BE CONTINUED.]

Harmless and Sure Cure for Warts.

Take two or three cents worth of sal ammoniac, dissolve it in a gill of soft water, and wet the warts frequently with this solution, when they will disappear in the course of a week or two. I have frequently tried this cure for warts, and it has never failed.

A. P.

[We are inclined to believe in the efficacy of our correspondent's cure for common warts, because we know that alkaline solutions softens them, and gradually eats them away, as it were. We have removed some of these unpleasant skin excrescences with a weak solution of potash applied in the same manner as the sal ammoniac.—Eds.]

Scientific American.

☞ It is a sign of extraordinary merit, when those who most envy it are forced to praise it.

From the British Farmers' Magazine.

Discussion on Drainage.

The following lecture was delivered by Mr. Robert Bond, before the *Halesworth Farmers' Club*, convened on the 24th of September, 1858, for the discussion (by previous appointment) of the subject of Drainage.

The Chairman having introduced the lecturer to the meeting,

Mr. Bond said: *Mr. Chairman and Gentlemen*—It is with pleasure I appear before you for the purpose of introducing the subject of drainage for this evening's discussion; and I presume we meet here to give our own individual experience in preference to quoting the published opinions and statements of the great and antagonistic leaders upon the questions of deep and shallow draining. I shall, therefore, adhere to the accounts of my own doings and my own conclusions, knowing well that your kindly feeling will absolve me from the charge of egotism, to which I do not fear in this case to expose myself. I only desire to see the subject divested of dogmatism, and resolved into sound and safe principles of action, that science and practice may not be disunited. Hitherto drainage discussions have been too much the battle-field of opposing parties, who have aimed rather at the triumph of their own pet dogmas than at a calm philosophical deduction—it has never been the arena of insipid unanimity, and I trust this evening we shall have that friendly dissent which excites discussion and leads to the general experience. We want to advance the subject, if only one step, toward the solution of scientific truth; but it will be as well for us to bear in mind that it has ever worn a cameleon hue, which for a practical demonstrative question can only be accounted for by the fact that diversity of soil and climate admits of correct and equally truthful variations in opinion and in practice. Where physical condition is the same, we can probably square ourselves to one notion, and agree upon depth and distance of drain; but physical differences as to subsoil, climate, and inclination, create practical differences in treatment. We may not attempt to discover a universal panacea for every ill applicable to the entire kingdom; this has been our vain and fruitless aim, but, as in physic, so in drainage, we can have no Holloway's ointment or Morrison's pills for the cure of all hydropical disease. We must vary our treatment according to our patient; but it is for us to pronounce our opinion as to the best system suited to this our own locality. To revert once more to the controversy for universal principles, we have often been interested to observe how fully the fashionable world of agriculture has followed a leader, and propounded the doctrine of deep drains at wide intervals, even in the spirit of a Cochin China mania; whilst the advocates for a shallower system at closer intervals have borne much condemnation whilst adhering to their principles, and they have in reality been somewhat prejudiced against all opposing claims. I mentioned I would confine myself to my own experience, but it is desirable I should inform you what that experience is. I have practised the different methods of drainage at various depths on different characters of soil, and my operations have extended over an area of upwards of one thousand acres of land, and containing in lineal measurement five hundred miles of drain. I have, therefore, necessarily devoted much time and thought to this subject, and it is one in which for years past I have felt considerable interest.

As to the advantages arising from draining, they are so self-evident that I need not enlarge to any extent on this point; let us remember, too, as Suffolk men, that if our forefathers were not the inventors of the art, they at least were amongst the foremost largely to adopt the practice and to appreciate its usefulness. Drainage is undoubtedly the foundation of all improvement, and I know of no greater agricultural revolution by art or nature than the effects of good sound drainage upon wet clay lands. Only let us consider for a moment its effects from our own observation. We can recal to mind the actual state of an undrained, thin-skinned, cold, clay farm. Can anything look more uninviting, or present a more unpromising and unproductive appearance?—It has the very aspect of barrenness; whilst its water-logged, sodden surface, covered and infested with every species of water-loving semi-aquatic weed natural to the soil points out the cause of its condition. Take it in its cultivation; 'tis labour! labour! labour for man and beast, the result unrequited toil, and the effect upon the soil but an exchange in the extremes from homogeneous mud to baked brick earth. And what is the produce but a stunted and scanty yield, with its narrow rows of dwarfed straw and puny ears. Nor can we wonder at such results, for our cultivated plants require moisture and not saturation, percolation and not stagnation, heat and not cold, aëration of the soil and not suffocation, friability and not compactness, manure and not poison. I have before said that drainage is the foundation of all improvement; without *it*, cultivation and manure are of but little avail; and I have observed upon such undrained farms that master and men, horses and cattle, buildings and fences, usually present the appearance, and apparently imbibe the air, of the surrounding property. I can well understand that a mismanaged impoverished farm produces poverty in the purse, parsimony in the outlay, ill-paid labourers, half-fed stock, and all ditto to match with the "Hungry hills," "Van Diemen's fields," "Upper and Lower Wilderness," which are the appropriate cognomens of such wretched spots of mismanagement and slavery.—Drainage, then, is the main point; it is desirable; it will pay. Why, by that one operation we remove the very poison and preventive of fertility; we remove the curse to our corn crops, and the food of the semi-aquatic weeds; we reduce the amount of necessary labour in cultivation; we produce friability, admit the renovating air, the invigorating rays of the sun, the enriching shower; render the manure applied available, producing so marked a change at harvest that we have an abundant crop of a superior character, arriving much earlier to maturity. Consequently, with the same rent-charge and rates, with diminished horse-labour, and other advantages, we have an infinitely better return; and we are enabled to improve and extend our root culture, by adopting autumnal cultivation, thereby increasing our return in stock, which has usually ruled disproportionately high in price, especially in times of cereal depression. I repeat, I am convinced no investment pays better, whether upon arable or pasture land. The arable becomes, under a sound system of continuously effective drainage, totally changed in character and fertility; double the amount may be produced, while the previously wet pasture is equally benefited, and changes its herbage. Remember in Job it occurs, "Can the rush grow without mire? can the flag grow without water?" Thus the water-grasses—from the lack of food, stagnant water, to sustain them—die out, and are succeeded by clovers and other nutritious grasses. Upon one pasture in Col. Bence's possession and occupation, there is an extraordinary instance of change. It was four years since an undrained pasture, presenting that blue poverty-stricken appearance peculiar to wet grass lands. The herbage, if it deserved the name, was a short, thick, broad, rush-shaped, sharp-edged grass, which the stock neither liked nor thrived upon; but now, since drainage, a change has gradually taken place, and it produces an excellent crop of succulent grasses. At the present, I had rather pay a rental of thirty shillings per acre for it than fifteen shillings previously. Since drainage, the surface has been continually covered with the old-sered plants which have died off, and I believe at one time many might have presumed that the pasture was even injured by over-drainage; this would have been a great mistake, and it is certainly improved fifty per cent. Allowing, then, that drainage is desirable, and that it will pay, still the question naturally arises—Which is the most efficient and the most economical method?

I have drained with pipes at the depth of three, four, and five feet, at various distances; I have also drained with whins and bushes; and I have used the mole-plough. With your permission, I will now give you the conclusions at which I have arrived. I am decidedly in favour of tile-draining; but, as it is an expensive operation, and a permanent improvement to the soil, it is essential that a part of the expense be borne by the landlord in connexion with the tenant; and the proportion of the outlay must be governed by the length of lease granted.—I believe as a general rule, where no lease exists, nor an agreement for the payment of unexhausted improvements upon quitting—I believe, if the tenant's outlay is governed by the cost of bush-draining, and the landlord pays the surplus for substituting pipes, it is a safe rule, and mutually advantageous. In such cases, those gentlemen under whom I have the pleasure to act, have adopted the safer course of arranging that their own pipe-layer shall place the pipes in the drain, quite irrespective of the men executing the digging. In every case it is desirable that the men contracting for the draining should have nothing to do with placing the pipe, as it prevents that hurried and imperfect workmanship which has repeatedly brought pipe-drainage into disrepute. What does a man care, who is only interested in executing the work as quickly as possible? He knows well he can bury the defects; and we have known instances in which the low spade has never been dug, and the pipes, consequently, not placed. Presuming, then, that landlord and tenant have made an equitable and fair arrangement, which is the best, the cheapest, the most efficient, and most judicious system of draining for our neighbourhood? what the depth and distance? which the best direction? what materials to use? the size of the pipe? the cost, duration, and return? Upon our clays, I do not approve of five-feet drains at intervals of forty feet, as depth, I find, does not compensate for the distance apart; the land is not thoroughly drained; the crop is best nearest the drain; and wetness is plainly perceptible in the intermediate space midway between the drains. Five feet, too, into hard, dry, blue, tenacious clay, is no joke; and the expense of the manual labour is very considerable; but, as such drainage is not sufficient, we must discard it as unworthy of our adoption, as ours is not a subsoil of gaults and gravels, where, I believe, such drainage answers well. I have drained at four feet deep, and twenty-seven apart, in stiff, chalky clay. I am satisfied it has answered, but yet not perfectly: the extra depth has not compensated for the additional distance. I would mention a fact in connexion with one field of fifteen acres I drained in this manner. I attempted to dispense with the water-furrows; but it would not do. The field, after a heavy fall of rain, was quite flooded, the furrows standing full; even the sketches themselves were partially under water. The water-furrows were, of course, again resorted to as a necessity.—Upon this same field, the tenant who succeeded me, not being satisfied that the drainage acted quickly enough, cut drains of whin transversely above the pipe-drains; but, to his astonishment, they have never acted, the pipe-drains carrying the entire quantity of water, thus most plainly proving that water enters the drain from the bottom, and not at the top and sides, as many have supposed. It is clear to reason that water gradually rises in the subsoil, with the fall of rain, till it reaches the level of the drain, when it naturally runs off in the aperture to the adjacent outlet. To return: I consider three-feet pipe draining, at sixteen feet apart, the cheapest and most effective. It has always answered my purpose best. The land has been more fully drained. There has been a freedom from wetness, also from too great a dampness, even at the extreme points from the drains; the crop has been even uniform in result; the pipes have been fully protected from injury, either by treading, or by the roots of our cultivated crops; and I pronounce it the most economical and the most efficient system of drainage for this neighbourhood. Three feet has proved efficient depth to prevent the slightest injury from capillary attraction; it has also allowed of ample depths for the roots of plants to work in. And it is singular that, whilst in agriculture some are advocating an extreme depth of subsoil, in which the plant can search for food, as if a mine of immense wealth existed there, often in the culture of fruit-trees, even after deep drainage, the descent of the root is prevented, because adverse to productiveness. I know objections have been raised to the use of pipes, especially on lands with but a slight fall. I have used them where comparatively flat, with perfect safety; but in such cases I prefer the two-inch-diameter pipe, in preference to the inch-and-half; and I strongly recommend the use of the theodolite, or spirit-level, to secure the best fall. I believe it is often impossible to discover the best direction for the drain without an instrument of the kind; and I have often been surprised to find so great an inclination on such an apparently flat surface.

As to the course of the drains generally, if the angle of descent is not too great, I drain with the best natural inclination, much preferring that principle of action to crossing it diagonally. I object that the drain should be in precisely the same direction or parallel with the furrow; consequently if the greatest gradation is in the line in which the field is generally ploughed, I afterwards alter the direction of the ploughing as I find desirable. I observe we frequently neglect to clear the eyes of our drains, and to scour the water-courses, as necessary. I believe it desirable we should not only carefully attend to these essential points, but it is also requisite that we frequently send round, at suitable times, to examine each outlet, that we may assure ourselves the drains work freely.

I am of opinion that the pipe drains will last for a vast number of years, probably fifty, or even for a much longer period.—Thus durability is one of the great advantages which pipes have over bushes, whins, or straw bands; where I have used such perishable substances as the latter, the drainage has been renewed after eight or twelve years. Further, whilst the pipes remain effective and the land yearly improves, the bush drains gradually fall in; even after four years they become impaired, and gradually get worse, until renewed; consequently during the latter part of the term the land has the disadvantage of partial and imperfect drainage. Again, rats and rabbits are great destroyers of bush drains; and I have one one field now, in which this description of drain is literally overrun with rats. The difference in cost between bushes and pipes I have found to be about £2 5s. per acre—£4 10s. for the pipe drainage, and £2 5s. for the bush drainage; consequently the tenant at will, or with a short lease, or of uncertain tenure, without a covenant for the allowance of unexhausted improvement, or without any direct assistance from his landlord in the draining, adheres to the bush system, which answers his purpose; nor would a heavier outlay be prudent under the circumstances. I have chiefly used the mole plough upon comparatively wet pastures, and in every case it has answered well at the small cost of 20s. per acre; and the drains have lasted eight years.

As to returns generally, I have found that drainage repays the outlay, according to the amount of the first cost, in two, three, or four years; and sorry indeed should I be, to farm wet clay land without such a system of thorough drainage. The advantage of drainage to the country at large is immense, and the benefit might be vastly increased by enlightened covenants between landlord and tenant. We want to ensure a larger extent of drainage, and of better quality. If a proprietor of clay land, I should certainly make the drainage with pipe a matter of arrangement upon letting an occupation, and I know in the course of years I should be greatly a gainer by the combined investment.

I would here remark that I am in no way opposed to deep drainage; I have found it to answer in West Suffolk upon springy land, upon gaults and gravels; but upon clays I am especially opposed to the expense, because depth does not compensate for distance.

In executing the work, I plough out the drain to one foot in depth, and the drainers draw two spades of one foot each—three feet. The items are:

Eight score rods of digging at 4s. 6d.	£1	16
2,500 pipes at 18s. - - -	2	5
Expense of cartage, laying pipe, also drawing drains, - - -	0	9
	£4	10

To recapitulate: We have considered the poverty and infertility of undrained lands; we have shown that drainage is the foundation of all improvement, the precursor of many advantages, ensuring a better return in grain and grass, allowing of improved and extended root culture, and of an increased profit from stock farming. I have recommended three-feet pipe drains at sixteen-feet intervals as the cheapest and most efficient system for this neighbourhood, the expense to be shared by the landlord, the pipe to be laid by a trustworthy person, the directions of the drains to a certain angle to be with the fall, larger pipes to be used on flat land, the theodolite or spirit level also to be used, water-furrows to be retained, that the water enters the pipe at the bottom of the drain, the drains and furrows not to be parallel; the superiority of pipes over bushes; the cost and probable durability of each system; the great advantage which has accrued to the country from drainage, and the need of a better agreement between landlord and tenant to ensure its more extended and more perfect adoption.

From the Southern Agriculturalist.

A Night with the Man who did not take the Papers.

It is a dismal day, truly, and as this cold nor'-easter drives its half-frozen mist into every fold of our outer covering, we are forcibly reminded of the old Scotch Proverb, "That a wind fra the east blaws nae gude for man nor beast."

But we will draw our great coat more snugly about us, and, peering from beneath the visor of a weather-beaten cap, strive to find something more cheerful to think about than the weather.

We are drawing near a settlement—these old fields grown up in pine and broomsedge, tell us that man has been here in times past. Now we approach fields yet full of dead trees and stumps, disfigured by bald spots and gullies. Wheat has been sown upon them, too—we know it by the stripes of deeper green running up and down the hills far away, as it fell more thickly between the cotton-beds.

The cotton-stalks stand high and low, and at about the right angle to throw a cradle-full of wheat to the wind at harvest time.—On our left is a big clearing—"more fresh land for cotton, to enable us to rest the old land." Rest!! Wheat, pastured by every living thing in the neighborhood—corn, oats, and so on—this is the common *rest*. On our right, upon the highest point of the plantation, looms up a huge log gin-house, and the *uncovered* screw. Why do people always select the highest point for a gin-house? and why are they always so hard run, that they cannot take time to cover a screw?

The piles of cotton-bales are arranged to show well—ten, fifteen, twenty-five, thirty-five and seven—forty-two—pretty good.—These people are taking the cream out of the hills pretty fast.

Hard by, on the hill-side, are rows of low log pens which we take to be stables, from the head of a disconsolate horse now and then sticking out between sundry fence rails, which are jammed into certain apertures, intended, we suppose, for doors. A few colts lean shivering against the wall, amusing themselves by a search after a stray blade of fodder in the gable.

A wagon-body lies upside down in the yard, and the "running gear" stands taking it coolly with its tongue lolling out upon the ground. The yard is perfectly bare—no indications of manure-heaps or littering. At the gate, an interesting fraternity of razor backs stand squealing; poor fellows! this gloomy evening has made you anticipate Sambo's evening hoo-ee! But the odor insinuating our olfactories just now, as well as certain unmistakeable signs by the road-side, warn us that the "c'uppen" is near; here it is on our right, on a bleak knoll, so as to be dry, we reckon. The remains of a few straw-pens, which, having been undermined, are tilted over about the lot, and the poor dumb brutes are scattered about, some trying to pick a palatable morsel out of the mouldy, half-rotten heaps, while others are propping themselves against the worm fence to keep off the wintry blast. It has always seemed to us that a cow must have a very strong imagination, or a great deal of philosophy, to think a worm fence a protection against old Boreas.

But here we are opposite the house—a two-story framed wooden building, 30 by 15, sheds and piazza to match. The front piazza is decorated by sundry strings of red pepper, seed bags, saddles, bridles, blowing horns, and tin pans.

Night is drawing her sable curtains round, and we must take such quarters as we can get. Our host meets us at the door, and ushers us into the "big room," where we find all the members of the family seated around a glowing green wood fire, before whose influence we soon find our humanities begin to flow.

The price of cotton, probability of rise or fall, increased production, horrid condition of the roads, railroad hopes, and enterprises of great pith and moment, were discussed in turn, till supper was announced. As we expected, fried ham and eggs, sausages, corn *light* bread, blue biscuit, cold pies and weak coffee, make the course.

After supper, we return to the blazing fireside. I glanced round the room, with the hope of finding a book or newspaper. Fox's Book of Martyrs, Remarkable Shipwrecks and Disasters, and Gunn's Domestic Medicine, made up the assortment.

"Can you give me a late paper, sir?"

"Well, I don't take any paper now; I took the *Brother Jonathan* a while, but them cussed Yankees got so ripping on abolition, that I quit the whole concern."

Drawing the first number of *The Southern Agriculturalist* out of our pocket, we remarked: "Here's a paper, sir, we picked up where we lodged last night, that promises to be a valuable acquisition to your department."

"What paper is it, sir?"

"*The Southern Agriculturalist,* a paper—"

"All humbug—I don't believe a word in this book farming. I never seed anything in one of them papers but stuff about manuring, ditching o' hill-sides, subsiling, and sich like."

"You don't believe in manuring, then?"

"No, I don't; it'll do very well for gardings, and turnups, and sich as that, but a body that plants a full crap never has time to be dickering about manures—its in the way of everything."

"Don't you believe that one acre well manured and well cultivated, will produce more than two badly managed?"

"Well, it might; but, like the Injun's gun, it'll cost more than it comes to. I can clear a piece of land and pay for it out of the truck made on it before I can bring an old piece back to what it was."

"Granted; but, my dear sir, after you've paid for it, what is it worth? You've worn your's out paying for it, and just the moment your's is gone, mine is good for a bale to the acre."

"Pshaw, stranger! that's all book farming; it looks mighty pretty on paper, but it won't work out the right answer. I tell you it *won't* do; I've got a neighbor who's always at it, and does nothing else; its manure, manure, subsile, subsile, and write for the papers; all stuff, sir; his crib's always empty, stock poor, and everything out o' fix, except his fancy patches—they're great; but there's the Injun's gun again pinting at you."

"Granted, too; but, my dear sir, did that neighbor succeed better before he commenced book farming?—did he ever succeed at anything he went at?"

"Well, I can't say that he ever did."

"That's the misfortune, my friend—whenever you find a humbug among the book farmers, it is trumpeted to the world, but when success crowns one's efforts, its, oh! he's a *practical* man. Nothing is ever said of your practical humbugs. Have you, my dear sir, no neighbors who never read a book, and still make poor crops?"

"Oh, yes; but you see that's owing to bad judgment."

"And it's bad judgment, exactly, that makes a bad book farmer—nothing else; the man who is not able to sift the chaft out of his wheat, we take it, will rarely get a good loaf of bread. In book farming, as in everything else—nothing should be taken for granted—the best of judgment, common sense, should be applied. If you put an inexperienced hand to work with a set of cabinet-maker's tools, the chances are that he will cut himself badly; he must become accustomed to their use, before he can employ safely or profitably; so in farming—a man must, by the exercise of good common sense and observation, learn something of the practice and the nature of what's to be done, before he can safely or profitably apply the learning of books. But there is one thing I know we will agree in, deep plowing, what say you?"

"I don't believe in it—its ruination to land—it turns all the clay up, and makes the ground hold so much water that it's never dry in the winter or wet in the summer. I never could make plowing and reading go together."

"Well, don't you think if you had ditched those hill-sides in your wheat-field over the way, you would have made more wheat and saved your land?"

"I don't; it wastes too much land, these ditches; I'd as leave have 'em where nature puts 'em as men. This eternal turning and twisting about over a field, a body gets no work done, besides cutting your land all up and ruining the looks of the field in the bargain."

Beaten at all points, to the evident delight of the youngsters, who thought the old man had used us up right, we struck our colors, and begged to be put to bed; and after a night's immersion in a spongy feather bed, with two little pillows for our companions—about as big as a goose-egg—in a shed-room, neither ceiled or plastered, sundry vacant window-lights stuffed with old hats, our olfactories regaled by a compound extract of dried peaches, sole-leather, and ing'uns sets, we dedicate to you, dearly beloved laborers in a good work, the benefit of our musings.

DOBBS.

Chief Aim in Farming.

There are many cultivators of the soil who seem to have no well defined purpose in their husbandry. They have no plans laid far ahead, which they are seeking to realize in their practice. They exist rather than live, are listless in their efforts, and effect no beneficial changes in the soil they attempt to cultivate. Everything about them wears the aspect of decay. The farm buildings are never repaired while it is possible to get along without it. You can see the gaps in the roof, where the winds have blown off the shingles, and the missing boards and swinging clapboards from the sides of the building. The fences are never re-set, no stones are dug from the mowing fields, and no drains are made in the swamps and low lands. They simply contrive to get along, their lands and themselves growing poorer every year.

There is another class, who have purpose and energy enough, but it is not wisely directed. Their aim in farming is to get the most possible out of the soil, and to put the least possible back, in the shape of composts and fertilizers. Their whole farming operations are based upon the theory that the soil is a living well that will always send forth its waters as long as there is anybody to draw. They plant and sow as long as they can get remunerative crops, and then either sell out, or resort to concentrated fertilizers, which stimulate the soil to part with its last elements of fertility, and leave it nearly barren. They are generally energetic men, work hard, and push their help as hard as they do their acres. They plant a very large breadth of land, and in a few years exhaust a whole farm. They do not believe in plowing in crops, or in making composts, or in saving the stable manures. They cannot see any utility in carting dirt into the barn-yard, and then carting it out again. It looks like a waste of labor. If near the shore, they rely upon fish to stimulate the soil when it fails to produce otherwise, and thus crop after crop of grain and grass is taken off, until the land is exhausted of its carbon, and runs to sorrel. If inland, they rely upon Peruvian Guano, which in a few years serves the soil in the same manner. The theory of these farmers is to get great crops, at whatever expense to the land. This is the skinning method of farming, and the more energy these farmers have the sooner the land is ruined.

Now, we believe the chief aim in all good farming to be the improvement of the soil until it reaches the point where maximum crops are produced at the least expense. Wise husbandry regards the farm simply as a *machine* for turning out crops. The machine is the matter of first importance. This is always to be kept in good running order, and its efficiency is to be increased by all economical methods. The man who farms upon this system will never sacrifice soil for a great crop. His aim is to have every crop taken off, leaving the land in a better condition than he found it. He aims in every working of the soil to increase its depth, and to add to it more elements of fertility than he removes in the crops, and to make the crops not only pay for themselves, but to pay for the improvement of the acres upon which they are grown.

In carrying out this aim, so as to realize these results, a man shows his skill as a cultivator. Ir is a comparatively easy thing for any one, who has money, to improve the soil so that it shall produce crops paying for the labor of growing them, and the interest on two or three hundred dollars an acre. Stable manure enough well plowed in will do this. But it is altogether another matter to make this improvement pay for itself. Yet it is a possible thing to do this, and there are farmers skilful enough to accomplish this result, and this we hold to be the true aim in the cultivation of the soil.

All good farming, then, must look to a permanent occupation of the soil. Economical improvements can not be made in a single year. The most judicious improvements, those which finally pay the largest profits, require several years to bring in their full returns. It is a matter of great importance that our farming population should not only be settled, but that they should feel settled, and plan all their operations upon the farm as if they expected to spend all their days upon it.

Here is a ten acre lot now in mowing, cutting ten tons of hay, worth one hundred dollars. It has in it some stumps, more boulders, some brush by the wall, and a few wet places, growing nothing but sour grasses and flags. It can be cleared of all obstructions, be underdrained, subsoiled and manured, so as to produce three tons of hay to the acre for the sum of say one thousand dollars. It will not pay the present occupant to do this the coming year, if he is going to sell out the year following. But he may accomplish all this economically in five years, furnish profitable employment for his help, introduce the mowing machine, and cut more fodder upon the field than he now cuts upon the whole farm. He may get crops enough from the field during the five years to pay for all the improvements, leaving the increased value of the land, certainly not less than a hundred dollars an acre, as the reward of his skill in husbandry.

This is an illustration of what a farmer's aim should be, and a good example of the kind of improvements that are needed upon most farms, at least upon the seaboard. The fields want to be cleared of rocks, the swales need deep underdrains cut through them, with smaller side drains running into them at right angles; old walls want removing, and the fields enlarging to ten or twenty acres; the whole surface need to be thoroughly worked and manured, so as to produce maximum crops. By this thorough method, horse labor may be substituted for that of man, so as save full half of the present expense of raising and harvesting crops. In smooth land, nearly all the planting and hoeing can be done by a horse; all the mowing, reaping, cradling and raking can be done by the same method.

The man who will lay his plans wisely to improve his soil, making this his chief object, and who will judiciously expend his capital in the improvement we have indicated, is in a fair way to gain a competence. This kind of farming in the long run, will pay amply, and we believe more surely than any other business. The skinning process, which is reckless of the soil, and looks only to the crops, is bad policy both for the farm and its owner. Let it be abandoned.

From the American Stock Journal

Care of Horses.

We may not hope to remove existing evils, simply by calling attention to them, but we can point them out, and leave the work of reform to whom it belongs. Let us confine ourselves, in this brief article, to some of the more prominent features in the care of horses.

Assuming that an animal which has good treatment, will be sound and healthy, while one that does not receive this care will be diseased, we are led to believe that to promote the health and comfort, and to secure the kind treatment of animals under his charge, should be the constant aim of the breeder. It does not necessarily injure a horse to work, or to trot fast, provided he receives good care after performing the labor. The practice is an inhuman one, of driving a horse fast, and then putting him in the stable without a good brushing; or letting him stand where the cold wind or night air comes upon him, without throwing a blanket over him as a protection. This is a simple matter, yet any one who neglects it, has no feeling for the health or comfort of his horse.

Feeding is an item of great importance in the care of horses; but as every breeder has satisfied himself in regard to the best and most proper method, it will be necessary to treat of it at length. Be sure to avoid musty feed of whatever kind, whether hay, straw, corn, or grain. It is dear at any price, and should never be fed to a horse. Give only good, sweet hay; and clean grain. It is an excellent plan to cut hay, and mix it with Indian meal or middlings. Salt the feed once a day, and often as once a week throw in a small handful of wood ashes. Pure water should be provided with regularity. If this course is uniformly pursued, horses will seldom be troubled with any disease, but will be healthy and sound. If those who now feed dry hay without cutting, will try the plan given above, my word for it, it will not only be found cheaper, but your horses will look fifty per cent. better.

Horses should have plenty of room in a stable, and not too much deprived of the liberty of motion. Close confinement after hard work, is apt to abate their circulation too suddenly, make them chilly and stiffen their joints. When horses are kept in stables, as they always are the coldest half, if not the whole of the year, the curry-comb and brush should be used faithfully every day. This treatment, will not only make them look better, but they will be more healthy, and have more courage and activity. It is a bad practice to omit this operation; more especially is it necessary after a hard day's work, when they begin to grow cold from being sweated by labor. Then it should *never* be omitted.

In warm weather, it would be better for the health of the horse if he were allowed his liberty, to roam at pleasure in the pastures, provided a shelter is afforded as a protection, both from the intense heat of the sun, and the damp, chilly atmosphere of night; as well as from cold winds and pelting storms. Horses that are worked every day in summer, should be kept on green fodder in the stable, in preference to grazing in pastures. It is no great burden to tend them; and a large quantity of manure will be saved.

Is there any good breeder who fails to perform these simple acts of kindness to his horse, contributing as they do in so large a degree to promote his health and comfort? Cannot our horses be kept in better order; receive more attention and greater kindness the coming winter, than they have previously? Is not the merciful man "merciful to his beast?" S. L. B.

Brookdale Farm, Maine.

The Hollow Horn.—"The disease of cattle, known as hollow horn, is causing an annual loss to be estimated by millions of dollars in this State alone. *This disease is spinal, caused by the skin adhering to the bone of the back and preventing circulation,* and may be cured as follows:

"Rub with the hand with as much force and friction as possible the hide of the animal, on the back-bone, from the tail to the horns, thereby restoring circulation."

From the Horticultural and Botanical Magazine.

Sources of Vegetable Matter.

BY DAVID CHRISTY.

The *elements* entering into the composition of vegetable matter, are of two kinds —*organic* and *inorganic*. The former class of elements, comprising by far the larger portion of the bulk of vegetable bodies, consists of those parts which during combustion, disappear in the state of gases, and the latter, of those that remain in the form of ashes. Combustion, therefore, in effect, is merely a separation of the organic from the inorganic elements of the substance which is burned. The same may be said, also, of the process of *digestion*. Vegetables, eaten as food by animals, undergo a process, in digestion, similar in its effects with that which takes place in their combustion : a separation of the organic and inorganic parts being effected, by which the former are converted into flesh and blood, while the latter pass off as excrement.

The process of decay, or *decomposition*, which dead trees and plants undergo, produces the same results as to those of combustion and digestion: it being only a much slower one, and requiring years to accomplish that which, in the other case, is done in an hour or a day.

By careful analysis, chemists have also discovered that the *ashes* of plants, left by burning, do not contain a single *inorganic element* that did not belong to the soils in which they grew; and repeated experiments have demonstrated, that a plant will not come to perfection in soils lacking any one of the elements found in the ashes of the mature plant of the same kind or species, except that one of the *alkalies* is sometimes substituted for another. It is inferred from this, that all the *inorganic* parts of vegetables are derived from the soils: that is to say, all that portion of vegetable matter which remains in the *ashes* after combustion, is taken up from the earth during the period of the growth of vegetables.

An examination will show how fully the chemical constituents of the ashes of vegetables correspond with those of the soils, and these, again, with those of the rocks from which the soils have been derived. Such an investigation will enable the reader to see, very clearly, the relations existing between the *earth* and the *vegetable kingdom*. A comparison of the organic elements of vegetables, with the elements of the atmosphere, will also show that with a single exception, they are all derived from the atmosphere. The relation, then, that the earth and atmosphere bear to the vegetable kingdom, is this : the earth supplies to all vegetables the *inorganic* elements of their growth, while the atmosphere affords to them their *organic* elements.

In proceeding to describe the chemical elements to which reference has been made, the *gases* claim the precedence, as occupying the most important position; and these being disposed of, the remaining part of the chapter will embrace a notice of the *non-metalic* elements, existing as solids at the common temperature.

Oxygen is a permanent gas, when uncombined, and is the most extensively diffused element in nature. It forms more than one-fifth part of the atmosphere, and nearly eight-ninths, by weight, of the water of the globe : enters as a constituent into nearly all the earths and rocks, and, with a few exceptions, into all organic products. *Oxygen gas* is prepared by disengaging it from some substance with which it has entered into combination. By means of the galvanic battery, it may be obtained in large quantities from water, and, by the action of heat, from the oxyd of mercury oxyd of maganese, or chlorate of potash. Oxygen may be made to unite with all the other elements except *fluorine*, and forms what are called *oxyds*, of which the rust of iron is an example. With the same element oxygen often unites in several proportions, forming a series of oxyds, which are distinguished from each other by the different prefixes enumerated in chemical nomenclature. Many of its compounds are *acids*, particularly those which contain more than one equivalent of oxygen to one of the other elements, and compounds of this nature are those which it most readily forms with the *non-metalic* elements: such as *carbonic acid* with carbon, *sulphuric acid* with sulphur, and *phosphoric acid* with phosphorus. But oxygen unites in preference with single equivalents of a large proportion of the *metalic* class of elements, and forms bodies which are called *bases:* such as *potash* with potassium, *soda* with sodium, *lime* with calcium, *magnesia* with magnesium, *protoxyd of iron* with iron, &c. A certain number of its compounds are neither *acid* nor *alkaline*, and are therefore called *neutral* bodies: such as the *oxyd of hydrogen*, or water, &c. The presence of oxygen is essential to the support of *respiration* in animals, to the *combustion* of vegetable or animal substances, and to the *growth* of plants.

"The combinations of oxygen, like those of all other bodies, are attended with the evolution of *heat*. This result, which is often overlooked in other combinations, in which the proportions of the bodies uniting, and the properties of their compound, receive most attention, assumes an unusual degree of importance in the combinations of oxygen. The economical applications of the light and heat evolved in these combinations, are of the highest consequence and value, oxidation alone, of all chemical actions, is practiced, not for the value of the products which it affords, and, indeed, without reference to them, but for the sake of the identical phenomena attending it. Of the chemical combinations, too, which we habitually witness, those of oxygen are infinitely the most frequent, which arises from its constant presence and interference as a constituent of the atmosphere. Hence, when a body combines with oxygen, it is said to be *burned;* and instead of undergoing oxidation, it is said to suffer *combustion;* and a body which can combine with oxygen and emit heat, is termed *combustible*. Oxygen, in which the body burns, is then said to support combustion, and called a *supporter* of combustion.* But every case of combustion, however familiar to us, is only a process of *oxidation*, in which the oxygen of the air combines with the particles of the burning material. This is as true of the rapid burning of wood as it is of the rusting iron. Both are the results of the combination of oxygen with these substances. But the oxidation of iron proceeds so slowly, that the heat evolved is dissipated as fast as produced, and never accumulates, while the more rapid oxidation of wood evolves heat in abundance. The oxidation of iron, however, can be made to progress with such rapidity as to produce a sensible evolution of heat, by introducing an iron rod, at a red heat, into oxygen gas. But iron is not the only substance that has its power of combination with oxygen increased by an increase of temperature. The affinity which all ordinary combustibles have for oxygen, is greatly promoted by heating them, and is rarely developed at all, except at a high temperature. For this reason, to insure the commencement of combustion, it is commonly necessary that the combustible be heated to a certain point. But the degree of heat necessary to inflame the combustible is, in general, greatly inferior to what is evolved during the progress of the combustion; so that a combustible, once inflamed, maintains itself sufficiently hot to continue burning until it is entirely consumed. Here the difference may be observed between combustion and simple *ignition*. A brick heated in a furnace till it is red hot, and taken out, exhibits ignition, but has no means within itself of sustaining a high temperature, and soon looses the heat which it had acquired in the fire, and, on cooling, is found unchanged. *Combustion* does not take place, as the brick includes no combustible matter to support it.

* Graham.

The oxidable or combustible constituents of wood, coal, oils, tallow, wax, and all ordinary combustibles, are the same, namely *carbon* and *hydrogen*, which, in combining with oxygen, at a high temperature, always produce carbonic acid and water; the volatile bodies which disappear, forming part of the smoky column that rises from the burning body. In combustion, no loss whatever of ponderable matter occurs; nothing is annihilated. The matter formed may always be collected without difficulty, and is found to have exactly the weight of the oxygen and combustible together, which have disappeared.

The discovery that heat is evolved in the combination of chemical elements with each other, serves to explain the principle upon which the consumption of food by animals tends to keep up the heat of their bodies. The degree of heat evolved, depending upon the rapidity with which combustion proceeds, and the rapidity of combustion upon the degree of temperature at which the combustible comes into contact with oxygen, it follows that the heat evolved in the *combustion*, *digestion*, and *decomposition* of vegetable or animal substances, must be very different in degree in these several cases. The evolution of heat during decomposition, with a few exceptions, is generally imperceptible to the senses.

Hydrogen.—This gas does not exist, uncombined, in nature; at least, the atmosphere does not contain any appreciable proportion of hydrogen. But it is one of the elements of water, and thus enters into nearly every organic substance. This gas is obtained purely by decomposing water, or some other substance with which hydrogen has combined. The Tables exhibit hydrogen as everywhere present, in all animal and vegetable substances, and in some minerals. It is indispensable to the vegetable and animal kingdoms. It is eminently combustible, and burns when kindled in the air, with a yellow flame of little intensity, which moistens a dry glass jar held over it; the gas combining with the oxygen of the air in burning, and producing water.

Nitrogen, besides constituting a portion of the air, enters into the composition of most animal, and many vegetable substances. This gas is usually procured by allowing a combustible body to combine with the oxygen of a certain quantity of air confined in a vessel, by which process the nitrogen is left free. It is a singularly inert substance, and does not unite directly with any other single element, under the influence of light or of a high temperature, unless, perhaps, with oxygen and carbon. To combine it with another body, requires the adoption of a circuitous method. A burning taper is instantly extinguished in this gas, and an animal soon dies in it, not because the gas is injurious, but from the privation of oxygen which is required in the respiration of animals. Nitrogen appears to be chiefly useful in the atmosphere as a diluent of the oxygen, thereby repressing, to a certain degree, the activity of combustion and other oxidating processes. By reference to the Tables of organic analysis, it will be seen that nitrogen is a constituent of the nutritious articles of food, both animal and vegetable.

Ammonia.—This gas is a compound of hydrogen and nitrogen, in the proportion of *one* atom of nitrogen to *three* of hydrogen. It is produced in the *destructive distillation* of all organic matters containing nitrogen, which has given rise to one of its popular names—the spirits of hartshorn: there being a large per cent. of nitrogen in deer's horns. It is also produced during the *putrefaction* of the same matters, and finds its way into the atmosphere.

Ammonia is a colourless gas, of a strong and pungent odour. It is inflammable in air in a low degree, burning in contact with the flame of a taper. Water is capable of dissolving about five hundred times its volume of ammoniacal gas in the cold, and the solution is always specifically lighter, and has a lower boiling point than pure water. Ammonia, in solution, is decomposed by chlorine. It is distinguished as the *volatile alkali*, as it restores the blue colour of litmus paper reddened by an acid, and exhibits, in other respects the properties of an alkali. Ammonia forms several classes of compounds with acids and salts, and exhibits highly curious reactions with many other substances. It will be seen as we proceed, that it is a highly important agent in agriculture.

Chlorine.—This is one of the simple, gaseous elements, is of a pale-yellowish green colour, has a peculiarly suffocating odour, is capable of being condensed into a limpid liquid of a bright yellow colour, has not been consolidated by freezing, and is easily combined with water. It exists abundantly in sea-water, and combines with sodium to form *common salt.* It destroys all vegetable and animal colouring matters, and hence is invaluable for bleaching linens and muslins. In combination with lime, it acts as a powerful disinfecting agent, in freeing the atmosphere of hospitals, close rooms, and cellars, from impurities generated by the decomposition of vegetable and animal substances. It combines with all the metals, and in the same proportions as oxygen; and, with three or four exceptions, these compounds are soluble and sapid.* It is also absorbed by alkaline solutions. It does not, under any circumstances, unite directly with oxygen, although several compounds of these elements can be formed: nor is it known to combine directly with nitrogen or carbon. It is "the leading member of a well-marked natural family, to which also bromine, iodine, and fluorine belong. Phosphorus, carbon, hydrogen, sulphur, and most of the bodies of this class, have little or no action upon each other, or upon the mass of hydrogenous, carbonaceous, and

* Having a taste.

metalic bodies to which they are exposed in the material world; and these substances being too similar in nature to have much affinity for each other. But the class to which chlorine belongs ranks apart, and, with a mutual indifference for each other, they exhibit an intense affinity for the members of the other great and prevailing class—an affinity so general as to give the chlorine family the character of extraordinary chemical activity, and to preclude the possibility of any member of the class existing in a free and uncombined state in nature. The compounds, again, of the chlorine class, with the exception of those fluorine, are remarkable for solubility, and, consequently, find a place among the saline constituents of sea-water, and are of comparatively rare occurrence in the mineral kingdom; with the single exception of *chloride of sodium*, (common salt,) which, besides being present in large quantities in sea-water, forms extensive beds of *rock salt* in certain geological formations."*

Although chlorine, as has been stated, does not combine directly with oxygen, nitrogen, or carbon, and may be mixed with hydrogen and preserved in the dark without uniting, yet a combination of these two elements is produced, with explosion, by the introduction of spongy platinum, or the electric spark, or by exposure to the direct rays of the sun. Even under the diffuse light of day, combination of these two gases takes place rapidly, but without explosion. Chlorine has such a strong affinity for hydrogen as to decompose most bodies composing that element, and in this process *hydrochloric acid* is always formed. This is the *muriatic acid* of commerce. The affinity of chlorine for most metals is equally great: antimony, arsenic, and several others, showered in powder into this gas, takes fire, and produce a brilliant combustion.

Chlorine, in some of its combinations, exists in all productive soils, and, from its active properties, in producing chemical changes upon nearly all animal, vegetable, and mineral substances, it is a most important agent in agriculture.

CYANOGEN.—This gas, though a compound of carbon and nitrogen, unites with other elements exactly in the same manner as though it were itself an element, and forms an exception to the rule, that simple bodies can only combine with simple, and compound only with compound bodies. It comports towards other bodies in a manner similar to that of chlorine, iodine, and fluorine. With iron it forms *prussian blue*, and with hydrogen the *prussic acid*. Under pressure this gas is condensed into a limpid liquid, which evaporates again on removal of the pressure. Cyanogen is *salt-radical*, and unites with all the metals as chlorine and iodine do, forming a class of *cyanides*. It may be obtained pure from the cyanide of mercury.

FLUORINE.—This substance has not hitherto been isolated, by the utmost skill of the chemist, as its powers of combination are such that no simple body has been found capable of resisting its action. It is found as a component of a few mineral substances only; one of these, *fluor spar*, is very abundant, and is noticed under the head LIME and its compounds.

This closes our notice of the simple gaseous bodies. Those named hereafter are formed by the union of one of these gases with some one of the solid elements.

CARBON is found in great abundance in the mineral kingdom, united with other substances, as in coal, of which it is the basis, and in the acids of carbonates. It is also the most abundant element of the solid parts of both animals and vegetables. It exists in nature, or may be obtained by art, under a variety of appearances, possessed of very different physical properties. It occurs crystalized in the *diamond* and *graphite*, or *black lead*, uncrystalized in *wood charcoal*, *anthracite coal*, &c. Carbon may be said to surpass all other bodies whatever in its affinity for oxygen at a high temperature; and being infusible, easily got rid of by combustion, and forming compounds with oxygen which escape as a gas, this body is more suitable than any other substance to effect the reduction of metalic oxyds: that is, to deprive them of their oxygen, and to produce from them the metal, with the properties which characterize it. When heated to low redness, it burns readily in air or oxygen, forming *carbonic acid* by its union with oxygen. The prominent position which carbon occupies in the composition of vegetable and animal substances, may be seen in the Tables.

* Graham's Elements of Chemistry, p. 329.

Carbonic Acid.—This gas is formed by the union of oxygen and carbon, in the proportion of *one* equivalent of carbon to *two* of oxygen. It is easily prepared from fragments of marble, limestone, or chalk, by pouring upon them sulphuric acid, or muriatic acid It is thrown off from the lungs of all air-breathing animals. It is also a product of vinous fermentation, and is largely produced in the burning of wood or coal. It is discharged from the earth by active volcanoes, and from fissures in their neighbourhood, long after they are extinct. It is evolved in the decomposition of animal and vegetable matter, and accumulates in vaults and wells as the *choke-damp*, occasionally so fatal to those who descend incautiously into such places. Although enormous quantities of carbon are constantly abstracted from the atmosphere in the growth of plants, yet the supplies from the above named sources, and a few others, seem amply sufficient to prevent any sensible diminution of its carbonic acid. It would seem that the decomposition of the vegetation of one period supplies the necessary elements for the productions of the succeeding one, and that thus the amount of carbon in the atmosphere is kept constantly equalized.

Sulphur is distributed very generally throughout the earth by means of its combinations with mineral and metals, which, in their decomposition, supply this element to the soils. It is furnished abundantly from many volcanoes no longer in a state of much activity, where it is collected for the supply of commerce. It is supposed to be the strongest chemical body, next to oxygen, and has, like it, a powerful affinity for all other elements. Sulphur, or its acids, unites with iron, lead, copper, zinc, lithia; with oxygen, hydrogen, nitrogen, carbon, phosphorus, ammonia; with silicon, alumina, potash, soda, lime, magnesia, manganese; with fibrin, gluten, starch, albumen, blood, cartilage, etc. Its other combinations, which are numerous, have little connection with agriculture, and need not be noticed. Sulphur burns readily at a very moderate heat, and is used in connection with phosphorus in the manufacture of friction matches. Possessing such active properties, sulphur is ever ready to perform its offices in the vegetable and animal kingdoms.

Sulphuric Acid, one of its most powerful products, in combination with oxygen, consists of *one* equivalent of sulphur and *three* of oxygen.

Phosphorus is essential to the organization of the higher orders of animals, being found in their fluids, and forming, in combination with lime, the basis of the solid structure of their bones. It is also found in most plants and minerals. Phosphorus, in its properties, is very closely allied to sulphur, but melts, boils, burns, and evaporates far more easily than that element. So readily does the oxygen of the atmosphere act upon it, and produce combustion, that it must be kept, and also cut, under water, especially when the atmosphere is at the temperature of summer heat. It is on this account that it is so valuable in the composition of friction matches, the temperature being sufficiently raised by a very little friction to ignite it. It is soluble in ether, alcohol, sulphuret of carbon, and oils. It is an exceedingly violent poison, and is used to extirpate rats and mice. Phosphorus is susceptible of four different degrees of oxidation—the highest of which is a powerful acid, and the acid character is not absent even in the lowest. Phosphorus, or its acids, has the power of combining with hydrogen, oxygen, nitrogen, chorine, sulphur, ammonia, potash, soda, magnesia, lime, iron, manganese, lithia, and a large range of ether elements, not connected with the growth of vegetation. With such extensive affinities, phosphorus must be an important element in soils. *Phosphoric acid*, which is so often named in the Tables, consists of *one* equivalent of phosphorus and *five* of oxygen.

Silica, Silex, or Quartz, which occurs so abundantly in the inorganic parts of vegetables, is a compound of oxygen and Silicon, in the proportion of about *one* part of the latter to *three* of the former. It constitutes a number of minerals, nearly in a state of purity; such as common quartz, rock crystal, flints, sand-stone, chalcedony, cornelian, agate, opal, common sand, and the water-worn white pebbles, met with almost everywhere. It also enters largely into combination with other substances, to form the rocks of the globe. It exists in two states in soils, *soluble* and *insoluble*. In its soluble state, it is taken up by plants during their growth, and constitutes a part of their mass, entering largely into the composition of the stalks of reeds and grasses, which have often a thick crust of silica on their bark. It is a very abundant mineral, and is estimated to constitute one-sixth of the crust of the globe.

But it is not in the bark of plants alone, that silica is met with by the chemist. It is diffused generally throughout the structures in which it occurs, says Quekett,* the latest writer on the subject, and in this connection is so intimate and equable, that it forms a complete skeleton of the tissues after the soft vegetable matters have been destroyed; in fact, the part it plays in reference to the organized tissues in which it is deposited, is precisely analogous to that existing between the animal and earthy elements of shell. Silica exists in such great abundance in the cuticle of a plant known as *equisetum hyemale*, or Dutch rush, that on this account the stems are employed by carvers in wood and modelers in clay, as a substitute for sand paper. It is also very abundant in the canes, but is by no means limited to this order of plants. It is contained principally in the cuticle, or outer bark, and in the various structures that are developed from it, such as hairs, spines, etc.; but in some instances layers of cells, lying much deeper than those of the cuticle, also abound in silica; and it may also be met with in woody fibres and in spiral vessels. In the burning of a haystack, masses of perfectly formed glass are always to be found among the ashes. This glass is produced by the combination of the silica of the cuticle of the hay with the potash of the woody fibre—glass being a silicate of potash.

In order to display effectually the siliceous matter in plants, it is necessary to expose the tissue under examination, to the flame of the blow-pipe, or, better still, to boil it for some days in nitric acid. By these means the organic portion is entirely destroyed, and the silica, withstanding these destructive agents, remains as a perfect model, or cast of the original tissue. In the husk of a grain of wheat, not only the cells of the cuticle, and layers of cells beneath, but also the fibers of the spiral vessels are silicified. Of all the grasses or grains used as food by man, rice contains the largest proportion of silica. In the husk of the rice, the woody fibres are also coated with silica; and in wheat, oats, and other grains, not only the stalks, but the hairs which stud the surface of their husk, partake largely of the siliceous deposit.

It will now be apparent that a vast amount of *silica* is yearly removed from our soils by the cultivation of the ordinary grains and grasses, and that a supply of this substance may be necessary to many soils, in order to insure good crops.

Boron is an element sparingly diffused in nature, and having some analogy to carbon. It is never found except in combination with oxygen, as Boracic acid. It is a constituent of several minerals, but the main supply of borax to commerce is from certain hot lagoons in Tuscany, and likewise from the hot springs of Lipari, and a few other places. It communicates fusibility to many substances in uniting with them, and generally forms a glass. On this account borax is much used as a flux. With the assistance of the vapor of water, it is slightly volatile, but alone it is more fixed, and fuses, under a read heat, into a transparent glass. Boracic acid is remarkable for the variety of proportions in which it unites with the alkalies.

All the foregoing elements are *non-metalic*. A brief review of their peculiar properties will close our remarks upon them.

Oxygen, hydrogen, nitrogen, and carbon, form the chief elements of plants and animals, and are, for this reason, called *organogens*, or generators of organic bodies.

Sulphur and phosphorus, with some of their compounds, are characterized by such great inflammability, that they have been called *pyrogens*, or fire generators.

Chlorine, iodine, bromine, fluorine, and Cyanogen, on account of their power of producing *salts* in combination with the *metals*, have been called *halogens*, or salt producers. Their compounds are called *haloid salts*, which consists of an acid and a base.

Silicon and boron occur in nature only in combination with oxygen, as silica and boracic acid. These substances are oxyds, and form amorphous salts with many bases, such as glass, slag, glazing, etc., and for this reason they have been called *hyalogens*, or glass producers.

Having disposed of the gases and non-metalic elements, the *light metals* may be next considered. They are called light metals, because they are specifically lighter

* London, 1852.

than other metals. These metals, so far as they are connected with agriculture, may be noticed in the following order:

1. Potassium, sodium, and lithium, the metalic bases of the *alkalies.*

2. Calcium, magnesium, barium, and strontium, the metalic bases of the *alkaline earths.*

3. Aluminum, and several kindred but rare metals, the metalic bases of the *earths.*

All these metals have such a strong affinity for oxygen, that they are usually met with only as oxyds, and it is to their properties in this form, that attention will be directed. The process by which the pure metals are obtained, can be learned from the common chemical works.

POTASH, or POTASSA, is an *alkali*, formed from its metalic base, *potassium*, by the chemical union of oxygen with this metal. This element is capable of forming several compounds with oxygen, and also enters into chemical combination, in various proportions, either as potassium or potash, with sulphur, chlorine, iodine, iron, cyanogen, carbon, hydrogen, nitrogen, silica, acetic acid, tartaric acid, oxalic acid, etc. The extent of its presence in minerals and vegetables, can be learned from the Tables. Its capacity for combining with so many of the elements existing in soils, and its almost constant presence in plants and trees, render it indispensable to the growth of vegetables.

SODA is an alkali, formed from its metalic base, *sodium*, by the chemical union of oxygen with this metal. Soda and sodium are capable of forming compounds with sulphur, chlorine, carbon, nitrogen, phosphorus, iodine, silica, boracic acid, etc. Like potash, it is of much importance in soils, as it enters largely into the composition of certain vegetables. In combination with chlorine, it forms *common salt*, which is the chloride of sodium, and with sulphur it produces the *glauber salts*, or sulphate of soda. "As potassium is in some degree characteristic of the vegetable kingdom, so sodium is the alkaline metal of the animal kingdom, its salts being found in all animal fluids."—*Graham.*

LITHIA, which is an oxyd of *lithium*, is not an abundant element. It exists in small quantities in a few minerals, and is met with in a few vegetables. Lithia and lithium enter into combination with chlorine, hydrogen, carbon, sulphur, soda, phosphorus, fluorine, etc. It is an *alkali*, like potash and soda.

LIME is an *alkaline earth*, having *calcium* for its base, and is formed by the chemical union of oxygen with that metal. Lime and calcium form chemical combinations, with carbon, sulphur, chlorine, phosphorus, nitrogen, hydrogen, fluoric acid, etc. Uncombined lime, or quick lime, which is the pure *oxyd of calcium*, can be obtained by heating common limestone to redness. This rock is a *carbonate of lime*, consisting of 43.71 parts of carbon acid and 56.29 of lime in 100 parts. Marble, calcareous spar, chalk, marl, coral, the shells of moluscous animals, etc., are all carbonates of lime, more or less pure. In burning any of the marbles or limestones, the heat drives off the carbonic acid and leaves the pure oxyd of calcium or common lime.

Lime, in combination with sulphur, forms *sulphate of lime*, or *gypsum*, which is composed of sulphuric acid 46.31 parts, lime 32.90 and water 20.79, in 100 parts. Heated to a proper temperature, the water is driven off, and *plaster of Paris* produced. Gypsum possesses highly beneficial properties as a fertilizer of soils. *Phosphate of lime* is composed of phosphoric acid 48.45 parts, and lime 51.55, in 100 parts. This mineral enters largely into the composition of the bones of animals. The *fluate of lime*, or *fluor spar*, is composed of fluorine 47.73 parts, and lime 52.27, in 100 parts. This mineral forms a very small portion of the earth of bones, but a somewhat larger proportion of the enamel of teeth. The *chloride of lime* has been noticed under the head of chlorine. Lime, in its various combinations in soils, performs the most important offices to vegetation, while at the same time it supplies a portion of the materials of the growth of plants.

MAGNESIA is an alkaline earth, having *magnesium* for its base, and is formed by the chemical union of oxygen with that metal. Magnesium has the colour and lustre of silver. It is very ductile, and capable of being beaten into very thin leaves, fuses at a gentle heat, and crystalizes in octahedrons. It undergoes no change in dry air or oxygen, but is oxydized superficially by moist air. Magnesium, when heated to redness, burns with great brilliancy, forming magnesia, or the oxyd of magnesium.

Magnesia is extensively diffused in the mineral kingdom, forming a large per cent. of the chloritic, talcose, and serpentine rocks, and is also a constituent of hornblende and one variety of mica. Carbonate of magnesia occurs native as a hard, compact mineral, in the proportion of magnesia 48 parts, carbonic acid 49, and water 3, in 100 parts. Magnesia is also extensively diffused in combination with lime, as a rock, called, *dolomite* or *magnesian limestone*, which is composed of carbonate of lime 54.18 parts, and carbonate of lime 45.82 parts, in 100. Magnesia, or its base, combines with silica, boron, carbon, hydrogen, chlorine, sulphur, phosphorus, nitric acid, and ammonia.

Baryta and Strontia are also *alkaline earths*, and have a great similarity to lime in their properties and combinations, but need not be noticed in detail in a work of agricultural chemistry.

Alumina is an oxyd of *aluminum*, formed by the union of *three* parts of oxygen to *two* parts of this metal. It is the only one of the *earths proper* that occurs in abundance. It exists in its pure state, with the exception of a trace of colouring matter in the *sapphire* of which the oriental *ruby* and *topaz* are varieties. *Emery* is nearly pure alumina. All these substances are extremely hard, being, in that respect, second only to the diamond. Like silex, alumina is an abundant ingredient in many minerals and slaty rocks, and is the principal constituent in clays. In combination with sulphuric acid and potash, it forms *alum*, and may be obtained in its metalic state from this salt. Its great capability of absorbing water, renders it of vast importance in soils, as a means of supplying moisture to the roots of vegetables. Its affinity for vegetable and mineral *colouring matters*, and its power of retaining and rendering them insoluble, connected with its equally powerful affinity for *ligneous fibre*, makes alumina indispensable in the arts and in manufactures. It also absorbs carbonic acid and ammonia, and supplies these two elements to vegetables. In combination with silica, it supplies the clays for bricks, porcelain, earthen-ware, stone-ware, etc. Alumina, or its base, enters into combination with hydrogen, chlorine, iodine, bromine, fluorine, nitrogen, sulphur, potash, soda, lithia, magnesia, manganese, iron, selenium, phosphorus, cyanogen, borax, etc.

"Next to silica, alumina occurs most frequently in nature, and, indeed, not only in clay and loam, but also in rocks and minerals; for instance the well known gray-coloured clay-slate, porphyry, etc. Feldspar must be regarded as the most important of the alumina minerals, and is found in greater or less quantity in granite, gneiss, mica, slate, and other rocks. Feldspar, like other stones, is finally disintegrated by the influence of air and water, and by heat and cold; it weathers, as the miners say, or is dissolved, and the silicate of potassa is thereby gradually removed by the water, so that, as the result of this decomposition, clay or loam remains behind. When the farmer lets his plowed land lie *fallow*—that is, remain uncultivated for some time—he by this means accelerates the weathering; soluble salts, potassa, soda, lime and other salts are thereby formed from the constituents of the soil, and to these salts especially, is to be attributed the greater fertility of fallow land over that which has been exhausted by cultivation."—[*Stockhardt.*] The same process of decomposition takes place in the other minerals of the rock composing the earth's crust, and by this means soils are produced.

Glucinum, and the several other metallic bases of the *earths*, closely allied to aluminum, occur so very rarely as not to demand a notice.

This closes what is considered necessary to be said in explanation of the properties of the *light metals*, which constitute the bases of the *alkalies proper*, the *alkaline earths*, and the *earths proper*. A few remarks in relation to each of these classes, however, by way of retrospect, will be useful to the reader.

Of all bodies, the *alkaline metals*, potassium and sodium, have the greatest affinity for oxygen; and their oxyds, potash and soda, are the most powerful *bases*, with which other elements unite to form compounds. Ammonia is also classed with the alkalies. These three alkalies are easily soluble in water, exert a strong caustic action on animal and vegetable substances, and have a great affinity for carbonic acid, which they absorb eagerly from the atmosphere, thereby becoming converted into alkaline carbonates. The carbonic acid in combination with these alkalies, cannot be expelled by heating, but it escapes immediately with effervescence on the addition of other acids. These carbonates are also easily *soluble* in water, and have a basic reaction. Potash and soda, combined with sand at high temperature, yield melted *glass;* and when dissolved in water and mixed with fat, on being boiled together they yield *soap.* Most of the salts which the alkalies form with acids, are soluble in water, and thus the moisture in soils afford them the opportunity of performing their part in the chemical preparation of the food of the plants.

The metals of the *alkaline earths,* calcium, magnesium, etc., have also such a very strong affinity for oxygen, that the preparation of them is very difficult. The oxyds of these metals, lime, magnesia, etc., though alkaline, are called *alkaline earths,* because they are *sparingly soluble,* while alkalies are *easily soluble.* They are also less caustic than the alkalies, and, like them, eagerly absorb carbonic acid from the air and form *carbonates* which are solid, and *insoluble* in water, while the carbonates of the alkalies are *easily soluble.* The carbonates of the *alkaline earths,* on the other hand, lose their carbonic acid by exposure to a powerful heat, while the *alkalies* do not.

The *earths,* alumini, etc., unlike the *alkalies* and *alkaline earths,* are entirely *insoluble* in water, which they absorb largely like a sponge. But alumina, it has generally been supposed, does not combine chemically with carbonic acid, but only absorbs it freely, as it does water, and retains both as agents to aid in the preparation of the other elements in the soil as food for plants. A part of the carbon of plants is now supposed to be derived from the soil, though their whole supply of this element had long been considered as derived from the atmosphere.

Iron and Manganese.—Of the *heavy metals,* these two only need be noticed, as they alone, of this class, enter into the composition, of the common vegetables cultivated by the farmer.

The extent to which *iron* is appropriated in the growth of animals and vegetables can be seen in the tables. Being always present in quantities larger and smaller, in the rocks, and entering into combination with any of the elements of the soils, the agriculturist need have little fear that his lands may become deficient in this element.

Iron combines with oxygen, carbon, chlorine, sulphur, phosphorous, cyanogen, potash, acetic acid, etc.

Manganese, in some of its forms of combination with oxygen or chlorine, enters sparingly into the composition of minerals and vegetables. It is never found as a metal in nature, but may be produced from its black oxyd by a high heat with charcoal.

On "Big Head."

Clinical Lecture on "Big Head," by George H. Dadd, V. S., Lecturer on Veterinary Science, at the Boston Veterinary School.

Gentlemen—The subject which I now propose to call your attention to, is one of great importance, from the fact that this disease, familiarly known as *"big head,"* prevails to an alarming extent in the south-western states, where some of you intend to locate, and very little is known of either its causes or pathology.

As the disease generally originates in and about the osseous tissues of the head, it is highly necessary that we understand the mechanism of bones, hence I shall make a few remarks calculated to enlighten you on this subject.

Bones have many things in common with the soft tissues and organs—for example, arteries, veins, nerves, and connecting cellular web. Their structure in the embryotic state, is vascular, yielding, and gelatinous. They have a fibrous investment externally termed periosteum, which is well supplied with arteries, veins, nerves, and absorbents, and by means of this fibrous tunic, vessels are distributed to the bones and their internal surfaces, and here also we find a fibrous membrane, similar to the one on the external surface, only more delicately organized. A portion of the cavity found in the shaft bones, is occupied by a considerable amount of adipose matter, known as marrow, enclosed in lumintated cells. Bones consist of two constituents—animal basis and calcareous matter; in the healthy adult, the proportions are as follows: animal matter, 33⅓ per cent; calcareous, 66 2-3 ⋈ 100.

Bones which contain certain distinct central cavities, as the antrum of the jaw, for example, are not connected in their centres, by *osseous,* but by cartilagenous unions; so that they expand, fall apart or burst, when the cartilagenous *braces* are decomposed.

The growth of bones, like that of shell, is effected by the addition of new tissues, to that already formed.

The ultimate constituent of bones are gelatine, animal matter, carbonate and phosphate of lime, fluate of lime, phosphates of soda and magnesia; the solidity of bones, therefore, depends on a due proportion of the same. Should there be a lack of phosphates the bones lose their cohesive firmness, and become soft, this constitutes the disease known as *mollities ossium*. The disease known as *caries* is a pathological condition analagous to ulceration, occurring in the soft parts.

We are now prepared to examine and form an opinion on the character of the disease now under consideration. The specimen of Big Head which I now offer for your examination was forwarded to me by my friend, Dr. Gordon, of Georgetown, Ohio; you will perceive that the walls of both the upper and lower jaw have all undergone dilitation in lateral directions, so that the width of the same is about three times the ordinary size, and on inspecting the interior you will see that the cartilagenous connection or braces, are all decomposed; hence the dilitation.

This dilitation has, no doubt, partly been accomplished by the presence of a large quantity of purulent matter, now in a dried, spongy condition, which has almost as you perceive, burst the bones apart. The bones, as a whole, appear to have lost their cohesive firmness and vitality, and are bordering on a state known as necrosis. I have removed a portion of one of these bones, which has been macerating for the past twelve hours in a weak solution of muriatic acid, and you see that it can now be rolled up like a piece of paper, showing very conclusively that it is deficient in calcareous matter; had it taken several days to abstract the same, the experiment might not have been so satisfactory; the animal matter preponderates, and a knowledge of this fact can be used to great advantage in the treatment of the malady, in its early stage, for it clearly indicates that phosphate of lime must be our chief agent; it should be combined with remedies possessing tonic and stimulating properties; hence I shall recommend the following formula:

Powdered	phosphate of lime,	4 ounces.
"	golden seed,	1 ounce.
"	sassafras bark,	2 ounces.
	African ginger,	1 ounce.

Mix. Dose—one ounce daily.

I recommend the *phosphate*, in conjunction with the other agents, because the function of nutrition may be deranged, and the latter agents tend to give tone and energy to the same. It is well known that the maintenance of the functions of animal life are almost entirely dependant on the due performance of the nutritive operations, and therefore the integrity and properties of all the *hard*, as well as soft tissues depend on their regular nutrition by a due supply of perfectly elaborated blood; this cannot be effected unless the functions of circulation, respiration and secretion, be performed with regularity. *Circulation* is necessary to convey a supply of nutritious fluid. *Respiration* and secretion separate the blood from its impurities. Therefore I advise you in all cases of this character to endeavor to improve the general health of the animal by such means as I have suggested, and at the same time see that the animal be fed on that kind of food which is calculated to promote the integrity of the organism; and you should advise the use of that kind of food which is rich in phosphates. It is very difficult to define the causes of a disease of this character. It may originate from a peculiar morbid habit, or idiosyncracy, or it may be the sequence of faulty nutrition. When an animal labors under any morbid habit of body, he is in a state far removed from that of health and various parts of the body become affected by the change, and even, should the power of forming good healthy blood remain, the organic force by which the constituents of blood are transformed into osseous stricture, must necessarily be enfeebled by the morbid habit, so that the power to produce metamorphoses is necessarily diminished. It is my opinion, and you may judge for yourselves, by inspecting the various specimens now before us, that Big Head usually commences in the fibrous tissues which is found in the internal surface of bones; a very peculiar feature of these fibrous tunics is, that when they once become diseased they run rapidly to purulency, and this accounts for the large amount of purulent matter, now in a dry state, which you see occupies the immense cavities between the walls of both upper and lower jaws. A very distinguished French writer contends, that "fibrous tissues hardly ever contribute to the formation of pus," this is evidently an error, for you are aware that, when the periosteum—a fibrous tunic—found within the alveolus, and reflected on the fang of a tooth, becomes inflamed, it often suppurates, and in consequence, we are often compelled to remove the tooth. I contend that it is the most common tissue that excites the flow of those exudations from arterial capillaries, which become converted into pus; hence we often find collections of pus both above and beneath the fibrous fascia, and aponeurosis of muscles; on and beneath the periosteum, and in the vicinity of fibrous tissues in various other parts of the system.

If in the early stage of *Big Head* you can detect, and even have good reason to believe that the cavity within the jaw-bone is the seat of accumulated pus, I would advise you to cut down upon the jaw and make a pendant opening into the same by means of *bone* forceps or trephine; in this way you liberate the imprisoned morbid matter, and have an opportunity to inject the cavity.—The injection should consist of pyroligneous acid and sanguinar canadensis, in the following proportions:

Pyroligneous acid, - 4 ounces.
Powdered Blood Root, - 1 ounce.

Throw a portion of this mixture into the interior of the jaw once daily, for a short time, by means of a glass syringe; of course it will be necessary, to improve the general health, by the means just alluded to.

"Big Head" has hitherto been named *osteo sarcoma*, and I also have named it so, but I think *ostitis* would be a more applicable term for it; for *ostitis* is a disease of inflammatory type, accompanied by synochoid fever, soon followed by suppuration. Whereas *osteo sarcoma* is a slow caries of bone, involving the soft parts, elevating the skin in the form of a conical tumor, discharge from the same ichorous corroding and fœtid.—Therefore I contend that the term *ostitis* when applied to a disease, such as you now see before you, gives us a better idea of its character than we have hitherto entertained.—*Valley Farmer.*

Curiosities of Commerce.

Turning over the pages of the Cyclopedia of Commerce, just published, a few matters attracted our attention, as curiosities, which we propose to transcribe for our readers. We were looking for the small things in commerce, matters that, in taking a magnificent, broad, and comprehensive view would be overlooked—just as the invention of the greatest importance for domestic purposes would be overlooked and unnoticed in its homely attire, when placed on exhibiton, and surrounded by works of polished art, costly machinery, and gorgeous furniture. An humble inventor once placed in such an exhibition, a few bunches of friction matches. They were unnoticed. Vistors went there, looking for some great thing, not realizing, that the despised package of splints, tipped with chemical fire, was the greatest thing in that proud collection, destined to work a revolution in the means of procuring artificial light, and to become a universal necessity, to be deprived of which would become one of the greatest inconveniences that could happen.

It is not more than twenty years ago, since the tinder-box was in universal use. It is abolished now. The invention of the friction match spread slowly, but who, at this day, would venture to say that they could do without it? Insignificant as they appear to be, single factories, with expensive machinery, cut up large rafts of timber, annually, for matches.

Under the head of *Pin*, we find that the manufacture of this indispensable little instrument was commenced in the United States, between 1812 and 1820, since which time the business has extended greatly, and several patents for the manufacture of pins have been taken out. The manufacture in England and other parts of Europe is conducted upon improvements made in the United States. Notwithstanding the extent of our own productions, the United States, imported, in 1856, pins to the value of $40,255.

Still keeping our attention directed to small things, we find that the import of needles into this country, for 1856, amounted to $246,000. It is said that needles were first made in England, in the time of the Bloody Mary, by a *negro*, from Spain; but, as he would not impart his secret, it was lost at his death, and not recovered again till 1566, in the reign of Queen Elizabeth, when a German taught the art to the English, who have since brought it to the greatest perfection. It is stated that the construction of a needle requires about 120 operations, but they are rapidly and uninterruptedly successive.

The temperance people will find an argument to enforce their doctrines in the fact that 41,071,636, bushels of grain, paying $25,000,000 duty are annually converted into malt in Great Britain, for Ale and Porter. It may reasonably be inferred that a great quantity of those beverages is drank there.

Ground nuts are quite an institution with Young America, 800 tons having been imported into the United States from Gambia, in one year. We, however, dissent from the encyclopedist, when he says that they are most used here as dessert, roasted as chestnuts are elsewhere. But France is the greatest market for ground nuts, where they are used for oil, of which they contain large quantities. The insignificant hazlenut, so agreeable to the palate, but so difficult to get is imported from Tarragona, to the extent of 25,000 or 30,000 bags of four to the ton. A kind of chocolate is prepared from them, and they sometimes have been made into bread. The pressed oil of hazlenuts is little inferior to that of almonds.

The original inventor of the Ayrshire snuff-boxes was a cripple, hardly possessing the power of locomotion. They are made of wood, admirably joined, painted and varnished, and were first manufactured only sixty years since. Instead of taking out a patent, the inventor entrusted his secret to a joiner in the village, who, in a few years, amassed a great fortune, while the other died as he had lived, in the greatest poverty. Speaking of snuff-boxes, snuff taking took its rise in England, in 1702.

Under the head of *Hair*, the Cyclopedia says that 200,000 pounds weight of women's hair is annually sold in France, and that the price paid for it is usually six cents an ounce.

One hundred thousand roses are required to give a yield of 188 *grains* of otto or oil of roses.

There are, doubtless, in this compendious work, many curious, inteersting, and instructive facts, if one had the time to find them out. And now, as we are closing, we notice quite a number of items, such as that a bale of Sea Island cotton weighs 333 pounds, and measures 35 cubic feet, while a bale of East India cotton weighs 383 pounds, and only measures 15 cubic feet, a fact of great importance in the question of transportation. What makes this great difference in cubic proportions ?—*Phil. Ledger.*

See well to the stock at this season of the year. Feed them well till the grass is high enough to afford them a good bite.

Rearing Calves.

A correspondent of the *Country Gentleman* says:

My calves are taken from the cow when they are two days old, and taught to drink, which they will generally do after being fed a few times. I teach them to drink by putting two of my fingers in their mouths, and then putting their mouths in the milk, which is in a pail held by the other hand; in sucking the fingers, they will suck up the milk—by gradually withdrawing the fingers from their mouths, they will soon learn to drink without any further trouble.

I give them four quarts of milk night and morning, and continue to feed them in this way as long as they are fed, providing I have milk enough for them, and they will bear that quantity; sometimes that amount of skim milk, especially if it is sour, will make them scour; if it does, I reduce the quantity until they will bear it. They are fed with new milk till they are four weeks old, when one-half sweet skim milk is substituted, on which they are fed about two weeks longer, when they are fed wholly on skim milk. When I commence giving them skim milk, I commence feeding them meal—putting a little in their milk every time they are fed, and increase the quantity of meal as the proportion of skim milk is increased, until they are fed on all skim milk, when I put a single handful of meal into each mess of milk that is given to them.—If they will not bear so much meal give them less. I prefer barley meal to feed them with while they are young, though rye, or rye and oats, make good feed; oatmeal, if bolted, I think as good as any, but if not bolted, the hulls trouble them about drinking. Corn meal is liable to make them scour, if fed to them without being cooked. The milk is warmed for them in cold weather, or until summer; after that it is fed cold. After this time they are fed on sour milk, and generally that which is thick—while making cheese, whey is fed instead of milk, letting it stand till it is sour, or else scalding it before it is fed to them. I continue to feed to them in this way till they are at least four months old, and as much longer as I have milk to spare for them—and the longer they are fed, the better I think, for I never had a calf hurt by being fed milk too long. Here I think is where so many fail in raising calves; it is not because they do not feed well enough, but because they do not feed long enough.

Most farmers feed their calves sufficiently while they are young, but they are weaned too soon, and turned out to pasture to shift for themselves—and such calves make but a poor shift surely. Some farmers seem to have a *chronic difficulty* about them on this subject; they think that a calf must be weaned and turned out to pasture as soon as the feed is good, at any rate, and frequently some of them are not more than two months old at the time, but they must all start at once. Under this treatment the young calf soon grows poor, generally gets lousy, and becomes so stunted that it never outgrows this severe and unnatural treatment, and in this way becomes a *living commentary* on the *mismanagement* of its owner, to say the least. Of this class we see very many scattered over the country, and they go to furnish the material for the class of stuff known in the market as the *scallawog beef*.

Some farmers injure their calves while young by feeding them too much; they seem to think that the more they can stuff into them the faster they will grow, and they generally will grow *out of shape* fast enough; they soon become what is called *pot-bellied*, with paunches large enough for yearlings. This is as much unnatural treatment as stinting them, and both should be avoided, if good, well proportioned animals are to be expected. After the calf is a few weeks old it will commence eating hay; it is then daily supplied with as much fine sweet hay as it will eat. Salt is occasionally given to them in small quantities, and while they are kept in the barn they have fresh dirt or a turf of grass placed where they can have access to it. During the time they are kept in the barn, they are furnished with a warm, dry and clean place, and they are frequently littered with dry straw or its substitute. No kind of stock need these things more, and none suffer more for the want of them. At about four months old they are turned out to pasture, where there is a good supply of fresh grass and clean water.

In the fall, as soon as the seed becomes frost-bitten, and the nights cold, (and in stormy weather,) they are put in a warm, dry place, and fed every day with a few roots, such as potatoes, turnips, refuse garden vegetables, or apples. They will soon learn to eat almost anything in this way. During the winter they are fed what good hay they will eat, and once a day with a mess of turnips cut so that they can eat them readily. In the fall of the year calves require particular attention, and a little time and expense devoted to them now, will add dollars to their value in the spring. Calves are tender animals, and are much affected by the cold storms and frosty nights of autumn—and unless they are protected from them, and furnished with a supply of good food at this time, they will grow poor, and soon lose what flesh they have gained for some time before, and what it will take them some months to regain; this is bad treatment for the calf, and unprofitable business for the farmer. With my course of treatment, under favorable circumstances, I get my calves to weigh, at one year old, 600 to 800 lbs. live weight—steers at two years old from 900 to 1,000 lbs., at three years old from 1,200 to 1,400 lbs., and oxen, when matured, 2,000 lbs., and upwards.

In raising stock of any description, the farmer's object should be to have his stock gradually growing till they are fully matured, or as long as he keeps them, and at no time to allow them to fall back, or to remain stationary.

I think that all the elements of success in raising stock of any kind, may be found in what should be every farmer's motto who is engaged in this business, viz: "Good blood, good care, and good keeping,"—and without these essential elements it is utterly useless for any one to pursue the business with pleasure or profit to himself, or honor to the profession.

C. T. Alvord.

How to Mend China.

From an English almanac we, a long time since, cut a receipt for mending China, and the opportunity having occurred for trying, we found it admirable, the fracture being scarcely visible after the article was repaired. It is thus made:—Take a very thick solution of gum arabic in water, and stir it into plaster of Paris until the mixture becomes a viscous paste. Apply it with a brush to the fractured edges and stick them together. In three days the article cannot again be broken in the same place. The whiteness of the cement renders it doubly valuable.—*Exchange.*

From the National Intelligencer.

The Camel—His Nature, Habits and Uses.

Washington, Nov. 29, 1858.

To the Editors of the National Intelligencer:

Gentlemen: I observed in the National Intelligencer of the 24th inst., a re-publication of an article from the *Alabama Sentinel*, "On the Uses of Camels, by a correspondent who signs himself "Jatros." The purpose of the article is to induce inquiry as to the usefulness of the Camel in the production of corn and cotton, and on our plantations generally. Having been occupied now ten years with the experiment of introducing the Camel into this country, permit me to offer, through your columns, briefly, to "Jatros" and other inquirers, a few of the results of reading, observation and thought upon these points. To do so concisely, and at the same time sufficiently, I will follow them in their order, as presented by your correspondent.

The Climative range of the Camel, within which he has been known indisputably to live, thrive and be useful, may be stated at from 50° to 52° of north latitude. The mean temperature of this zone may be rated at from 50° to 68° Fahrenheit. As animals, we know, are diffused over the globe, first, according to zones of climate, and, second, according to degrees of longitude; and as we know that "camel land" and the United States are included in the same zones of climate; and as, further, the secondary order of arrangement (by longitude) is but of trivial importance, your correspondent is right in his supposition "that the camels would flourish in any latitude within the United States."

The cost of a Camel, a good serviceable one, landed at Mobile or Pensacola, may be put down at from $150 to $200—not more, I think, if the purchase and transportation are judiciously managed. The greatest expense in general will be in the freight. In any project, therefore, for the introduction of the animal, this must be the main item for close calculation. So far as the voyage is concerned, there need be no apprehension, for I know of no animal of so little trouble and so comfortable at sea as the camel. I speak from a tolerably large experience in the transportation of horses and mules during our war with Mexico. So far as the motion of the vessel goes, whether in calm or in gale, one hundred camels would not cause as much anxiety or give as much trouble as ten horses.

The camel does not consume more food than a horse or a mule; prefers a coarser diet; satisfies itself readily with either scanty grazing or browsing; requires feeding but once a day, being a ruminant; and would be with difficulty distressed for water. It requires no close stable; only a shed protecting it from cold northerly winds and from falling weather; and requires no grooming, though certainly healthier and better, like all other animals, for a clean skin. The camel is undoubtedly a hardier and thougher animal than the horse; not surpassed, if equalled in these respects, by the mule; and with half the forage of either, and with two or three hours of grazing or browsing, can be kept in condition. In addition to the economy of forage, the use of the camels saves the outlay for wagons and carts, harness, shoes, and the necessary repairs of them. The pack-saddle being so simple in its construction as to be readily made on the plantations, its cost will be but trifling. Its weight, moreover, compared with that of a wagon or cart, increases the physical energy devoted to the transportation of goods. For short distances, say about a plantation, or for six or eight miles on the road, a strong camel will carry on an average from eight hundred to one thousand pounds. The *Tiulus* of Asia Minor, the produce of the double-humped Bactrian male on the single-humped Arabian female, will average, for the same distances, from one thousand to fifteen hundred pounds. All of the statements in my official report of what was done by the camels under my direction in Texas, are made from accurate weights and closely computed distances.

So far, the general advantages from using camels may be summed up as follows:

They will flourish as well in the United States as either horses or mules.

They may be introduced at Mobile or Pensacola at rates not greater, certainly not much greater, than present prices for good mules.

They are not as expensive to feed as horses or mules.

They require no close stabling or grooming.

They are as tough and as hardy as either horse or mule.

They save a heavy outlay for wagons, carts, harness, and shoes, and a constant tax for their repairs.

Their physical energy is not largely drawn upon for the draught of a wagon or cart, and therefore is proportionately given more usefully to the transportation of goods.

They will do more work at the same cost and keeping than either horse or mule.

These are the general advantages that I think may be fairly claimed for the camel. Now, let us examine how far this animal, with these advantages, may be suitable for our plantation or farm uses.

In Egypt I have seen the camel used in cities and in the country, on plantations, in fields, and on the road, for every purpose that horses and mules are used with us. I have seen them transporting bricks and broken stone from yards and quarries for building, sleepers, rafters, scantling, boards, or flooring, &c. I have seen them carrying chopped straw, corn, cotton, fodder, merchandise of all kinds, men, women and children, and with their burdens stepping intelligently and with sure-footedness into and out of clumsy ferry boats. And I have seen them usefully occupied in carrying burdens on the dams and check banks of our rice plantations. Is there anything more than these uses that our plantations and farms require?

As a Southern man, from a cotton, corn, and rice growing section, I believe that in many respects we might use camels with advantage in our agricultural labors, while pulling corn or fodder, or picking cotton, in transporting them from the fields to the barn or gin-house, in carrying seed, manure, fire-wood, &c., about the plantation, and in transporting produce and goods to and from the railway or market. So far as the negro is concerned, I am satisfied, from a knowledge of the nature and habits of both, that no animal better suited to him in all respects than the camel can be given to his management.

That the preceding may prove of interest enough to find a place in your columns, and result in benefit to our country, especially to that section of it we both hail from, is my apology for trespassing upon you.

Very respectfully,
Your obedient servant,
HENRY C. WAYNE,
Major United States Army.

From Dickens' Household Words.

Roses.

O! the ineffable delight of a trip into the country, to see a show of roses, when you have a high-spirited, fast-trotting, rose-fancying hobby-horse to ride! "Cato,"—one of our most learned authors, informs us—"Cato seemed to dote on cabbage." Myself may boast of out-Catoing Cato, in one respect: for I dote to distraction on cabbage-roses. Take a full-blown Provins to bed with you; lay it on your pillow within reach of your nose; sniff at it an amorous sniff from time to time till you fall asleep; perform similar ceremonies the first thing when you wake in the morning, and you will not be too hard on my infatuation. I particularise a Provins, because although the tea-scented roses are delicious, while the Macartneys smell like apricot-tart, and the Jaune Desprez is a happy blending of raspberry jam with the finest otto, or atargul; nevertheless, all roses by name do not smell equally sweet. In fact, some roses are no roses at all. The Christmas rose is a hellebore, which deserves a little protection with a hand-light if we desire it to wish us a happy New-year; the Guelder rose is a sterile snow-ball, which ought not to repudiate its classical title of Viburnum; the Rose Trémière, or Passe-Rose, is a hollyhock, which renders excellent service in the decoration of garden scenery; the Rose of Jericho is a cruciferous individual (?)—the note of interrogation shall be discussed hereafter—belonging to the same Linnæan class as cabbages and turnips, and in no way related to any sort of rose, "for, though it be dry, yet will it upon inhibition of moisture, dilate its leaves and explicate its flowers contracted and seeming dried up;" the Rose-Laurier, or Laurel Rose, is the Oleander, an elegant shrub with bright pink flowers, delighting to grow by the water's edge, but which, Algerian colonists say, poisons the brook that runs at its foot. The Rosa Mundi, the World's Rose, or fair Rosamond, was a pretty young woman who was considered by her friends to be under no particular obligations to Queen Elenor; the Rose Effleurée, the Handful of Roseleaves, or bouquet for children and families, is a nice little volume of tales and poetry. I am sure that the roses of heraldry—stained-glass roses and gothic stone roses—have no right to claim any other than a verbal relationship with the legitimate family of Rosaceæ. And the rose on the spout of my watering-pot is only a bit of red-tin pierced with holes. All these, (with the exception of the lady) are false, sham roses, of fleeting merit, and mere outside show; whilst a real rose, even in its grave of pot-pourri, exhales a pleasant odour, and is sweet in death.

Know, ye who are unfamiliar with roses, that the queen of flowers, like the changeful moon, presents herself under different aspects. There are roses which resemble the beauties of the South; they blossom once in their season, they dazzle you with their charms, and then they depart. You have to wait for another generation of blooms. There are others—we call them perpetual roses, while the French style them rosiers remontants—which do not begin perhaps quite so early but which, having once begun, go on continually, till old Father Nip-nose comes to town. Even then, if you can shift them into warm, light and airy quarter, in their pots or tubs, they will go on flowering and flowering till you fear they will flower themselves to death. Observe, that some of the old-fashioned sorts maintain their ground against new-born rivals. What an indefatigable bloomer is the old crimson China, or semperflorens! What an emblem of perseverance and hardihood is that sweet-scented, semi-double, faithful friend, the Portland, or Pæstan rose, which will present you with a cluster of bright red buds, reflecting the gleams of December sunshine! The biferi rosaria Pæsti merit their repute of more than two thousand years; for after all we stand most in need of flowers which will carry a cheerful face under adverse circumstances. Any plant, or man, can be full of bravery during the hey-day of summer and prosperity; but our strongest sympathies are with whatever will make a goodly show, and even bear blossoms, in spite of the insults of the north-wind and the disdainful looks of the sun. Amongst the most unflinching bloomers is the Stanwell Perpetual, a spinosissima, or Scotch rose, with small double flowers of a very pale blush, which assumes for its motto, Never say die! Another stout-hearted flower, belonging to quite a different race, is Aimée Vibert, with its bright and almost evergreen foliage, and its thick clusters of pure white blossoms.

Perhaps, though not the most continuous in its succession of blooms, yet for lateness, as well as for the combined perfections of form, scent, hardiness and colour, the best autumnal rose yet raised (certainly in the Portland or Quatre-Saisons class), is a turncoat flower whose history I blush to relate. But it averts your censure like other fair offenders; for, if to its lot some floral errors fall, look in its face, and you'll forget them all. It made its appearance during Louis the Eighteenth's time, and was named Rose du Roi, or the King's Rose, in compliment to him. But when Bonaparte came over from Elba, and put the legitimate king to flight, the proprietor, thinking that this new rose with any other name would bring in more money, deemed it good policy to rechristen it Rose de l'Empereur, or the Emperor's Rose. But the hundred days were a limited number—fate did not choose to make them a hundred and one—and the battle of Waterloo again changed the aspect of political affairs. The rose ratted once more, and was re-styled Rose du Roi. It is known in England as the Crimson Perpetual—I should have called it the Crimson Weathercock. To complete its diplomatic education, it only wanted to have passed for a time as the Rose de la République Rouge, or the Red Republican Rose. No autumnal rose-garden is complete without the two Desprez, the red (or Madame), and the yellow, or rather the salmon-coloured. The Géant des Batailles is also a hero whose prowess and whose manly beauty insure his gracious reception by the ladies. None of these are what the nurserymen call new; most of them are quite antiquated; but they will hold their own, and maintain their ground, long after Louis Philippes and such-like loose ragged things have been swept clean away by the breeze of forgetfulness.

I think that if you can make only one voyage of rose-discovery during the summer, it is better, more sentimental, and altogether more poetic, to defer it till the robin has commenced uttering his autumnal notes. One out-of-the-way rose-garden that I wot of is a gem in its own peculiar style. To get to it, you put your square-built old pony into your rumble-tumble four-wheel; you drive through high-hedged lanes and over breezy commons till you reach the turnpike-road, which traverses a rather secluded district of the country; you pass gentlemen's seats on the right and on the left, with their verdant parks and noble timber-trees; you drive through a village, with the prettiest of gardens before each cottage—no two of the cottages or gardens being exactly alike—

while overhead is a flickering bower of cherry, plumb, and walnut-trees, chequering the road with sunshine and shade; you pass a brick-kiln or two (symptomatic of the soil); and, after peeping over clipped quickset hedges at the brightest of pastures and the richest of crops, you reach a solitary way-side inn—the Merman. The pony knows where he is as well as you do, and stops. From out a stable-door steps a hale young man, with one hand partly bound in a cotton handkerchief, and the other covered with scratches more or less recent. He has been budding roses these many days past, and, as our noble allies say, Il vaut souffrir pour les roses (Roses are worth a little pain); nevertheless, he unharnesses old Smiler, who straightwith proceeds, snorting and whinnying, into the well-known stable. You enter the house, and find everything clean, countryfied, and way-side-inn-like, without the slightest pretensions to metropolitan adornments. You are met by a tall, gaunt, dignified woman, certainly not handsome, and assuredly never better-looking than she now is. She is the mistress of the house, and the rose-grower's wife. She looks as if she thought it would be a sin to smile more than once a week; but she is an admirable cook—and did you ever know a good woman-cook who did not look dreadfully cross at times? You order dinner for five precisely, and step into the garden by a side-door, invisible from the road. The master, the enterprising horticulturist, has heard the sound of your rumble-tumble's wheels, and is coming to meet you—with slow step, unfortunately, for he has lost a leg since he began to grow roses. You have before you a tall, stout man—stouter since his loss—not handsome, but with an honest open face, which prepossesses you at the very first glance. Between brother enthusiasts, preliminary ceremonies are short; so you walk up and down amidst hundreds and hundreds of roses—tall, middlesized, short, and level with the ground, climbers, dwarfs, standards, pot-plants, white, blush, cream-colour, straw-colour, pink, crimson, scarlet, slate-colour, spotted, edged, striped, and blotched. You investigate the character of the early summer roses, whose bloom is past—you inquire into the prospects of the newest new varieties, and often get a shake of the head as the only response of the oracle—you ask whether the good old sorts still remain at par in the market, and Jove replies, with a complacent nod, that they are a wholesale staple article of public consumption. "This bed," he says, "entirely of Bath white moss, has been budded to order for America." You then look round and decide upon your plants, combining a sprinkling of the unknown and the speculative with a larger proportion of the approved and the true. And, then, a sharp magisterial voice rings the dinner-bell with the tongue of authority. You dare not remain longer in the garden, even if you wished to, which you probably do not; for, immediately after crossing the threshold of the side door, you enter, to the left, a neat, snug little parlour with the window open, staring point-blank at the roses, and a little white-clothed table, hardly big enough for your party, but tending much to merriment and good fellowship. You take your seats, and instantly stern Minerva drops amidst you such mutton-chops, such green peas, such potatoes, and such melted-butter, followed by such a currant tart and such a rice-pudding, that—oh!—words may express thoughts, but not sensations. The goddess concludes her miraculous performance by the production of a cream-cheese of her own manufacture. Expressions of your appreciation and delight burst from your lips, and—marvel of marvels—she smiles! Then, a bottle of wonderful port, and an invitation to the master to partake of it; he obeys the summons, and sets on the table a dish of Elton strawberries and a green-fleshed melon, grown in some hole and corner stolen from the roses. Then you ride your hobby-horses full gallop: how such a thing, sent out at such a price, turns out no better than a handful of coloured rags; how so-and-so's stupid gardener committed an outrageous donkeyism: how such another's inventive genius would produce leaves and flowers from a ten-year-old broom-stick; how this year's committee of the Highanmityshire Horticultural Society is working; and, above all, whether the rose-fever has yet attained its climax. Then you stroll once more round the garden to fix upon a few additional protégés; you drink a parting cup of tea; Smiler takes his place between the shafts; you drive homeward through the cool evening breeze, and, as you watch the glow-worms lighting their lamps amidst the dewy wayside grass, you make a vow never more to judge of a woman's good qualities by her looks alone. Verily, rose-gardens are bits of consecrated ground, cut out and separate from common earth. If you could drop into the midst of this one, at the end of July, after having been shut up for nine months in a smoky city, you would go down on your knees before the flowers.

Roses have had a good deal to go through; it is true they have had a good long while to go through it in. When I began rose-growing, no body would look upon a rose in any other light than as a pretty sort of thing, very well for school-boys to talk about after a course of Virgil, Horace and Anacreon, and permissible for kind-hearted old maids to shelter in the obscure retreats of their obsolete gardens; but as florist's flowers, the idea was not to be entertained. Dahlias were then all the rage, and were carrying off exclusively, innumerable silver cups, tea-pots, sugar-tongs, medals, certificates, and highly-commendeds. Mr. Cathill (horticulturist, Camberwell,) records that when Mr. Rivers first began to speculate largely in rose-growing, his old foreman, long since gone to his last resting-place, came one day, with a very grave face, and said:

"Master Tom, you are surely out of your mind. What are you going to do with all those brambles? It is a shame to plant them on land that would grow standard apples!"

And so it was with myself and my friend: a lady, who imported the art from France into our neighbourhood, and who did me the honour to make me her disciple. We were looked upon as benighted heretics, humanely tolerated as amusing enthusiasts, and just escaped ostracism as hetrodox gardeners; because, while others were running mad after Mexican tubers with repulsive effluvia, alike offensive to man and beast, we cared only to complete our respective collections of a hundred fine varieties of the rose. If many were too polite to say so, they certainly thought, that it was a burning shame, so it was, to grow nasty prickly roses in a garden that would produce double dahlias; and the scorn of the public attained its height when it heard of our begging ladies for their worn out parasols to shade both our very dark crimson and our double-blooms and when they over-heard us rejoicing at a pic-nic water-party when a thunder-storm drove muslin skirts and white chip bonnets pell-mell below the hatches—that the delicious shower came just in time to save our last-inserted buds! But it is a long lane which has no turning; and the poor neglected roses soon came to a path which led them to make their triumphal entry. I daily make use of some convenient plate, engraved with the cyphers H. H. S., which my roses won at the Highanmityshire shows. My roses and I well deserved the reward thus bestowed in the shape of pieces of silver; for I worked them all with my own proper fingers, and they exerted themselves to the utmost to return the obligation.

I strained just now at the word individual, as applied to plants; because it has been a question, among the dons of vegetable physiology,—What is an individual in the world of botany? and judgment has been pronounced that a bud is an individual. A bulb, therefore, such as a Tripoli onion, which is nothing more than an overgrown bud, may claim to be no more than a simple individual; but an oak tree is a herd, a crowd, a throng, a joint stock company, composed of as many individuals as there are buds on its trunk, branches and twigs. What most concerns us here, is, that buds enjoy a vitality of their own, which is more or less independent of the rest. In cold wet climates certain plants being unable to flower to any useful purpose, revenge themselves and have their own way in the end, by throwing off living buds, which take root and settle themselves in the world with the utmost facility. Such plants are styled viviparous, or plants which bring forth their young alive. There are even leaves whose fecundity of constitution engenders a crowd of little budlings round their outside edge. Unless the practice of budding were extensively employed, the supply of choice roses could not meet the demand.

New varieties of roses (with a few rare exceptions) originate from seed. Suppose you have raised an invaluable novelty, like the Rose du Roi, or my own Maria. Your plant is, at first, unique; only a single specimen exist in the world. How to propagate it, distribute it, bring it into the market, and make money of it? Its seeds, supposing any attainable, would probably produce offspring inferior to itself. Cuttings are a tardy and limited means of multiplication; besides, several subsections of the genus Rose strike root, as cuttings, with difficulty. Layering is a still slower process, and often not a bit more certain. Budding accomplishes all we can desire.

It has been discovered experimentally, that the buds of shrubs and trees, if skilfully and surgically inoculated upon other shrubs and trees nearly related to themselves—that is species belonging to the same genus—will grow and thrive. In a few cases, the faculty is extended a little more widely; thus, a lilac scion, grafted on an ash-stock, will live just a little while—a summer or two. But the nearer the relationship, the greater the success; but even then, vegetable caprice has often to be contended with. For instance, many pears do well on quince stocks, others do not do well; and there is no knowing, except empirically, what the exact result will be. Therefore, if any gardener tells you gravely that he has budded a rose on a black-currant bush, or grafted a white-currant scion on a red-cabbage stump, look him full in the face; do not laugh, if you can help it; but set him down in your private memorandum-book as—I will not here say what.

Now though, theoretically, any one species of rose may be budded upon another, this general rule will scarcely be carried out in practice; because common sense would prevent your budding a vigorous species on a weakly one, or a hardy species on a tender one. There are families of roses—the tea-scented, for example—which are killed by any but our mildest winters, and must be treated almost as greenhouse plants. For general purposes, the best stocks are furnished by the dog rose (Rosa-canina.) Choose such as have grown in exposed situations, and have well-ripened wood, in preference to the green and immature, though pretty stems, that have been drawn up lank, under the shelter of trees. The sweetbriar is not sufficiently hardy. Extra robust and tall stocks may be obtained from the Highland rose, which grows in the valleys of the Grampian hills. If you want to cover a wall with a climbing rose on which to bud a number of varieties, the crimson Boursault will answer satisfactorily, and all the better that it is a thornless species. Beginners are apt to be too fond of over-tall standards; but experience will tame down their lofty ambition to from two feet to two and a half.

You will have remarked the beautiful effect of looking down upon a valley or a forest from the commanding eminence of a mountain side. Remember this principle when you are planting the stocks that are to form your future rose-parterre. Standard roses, once budded, grow but little, if at all, in height. They increase in thickness; and it is curious that in that respect the growth of the stem is subordinate to that of the head; that is, a vigorous head will form a corpulent stem, while under a puny head the body will remain puny—an apt lesson for administrations and governments in general.

Wild rose-stocks are now an article of commerce. By giving any order to proper persons you may obtain a supply to any reasonable amount. The nearer home they are found, and the sooner they are replanted in your nursery, the better. November is the month of months for the purpose. In the early dawn of rose-growing in England, you could not get what you wanted through such regular channels as now; but what you did get were finer stocks, in consequence of their being less sought after. I had an agent in my service who was an enthusiast. On being shown a collection of standard roses in splendid bloom, he instantly caught the idea, and impatiently longed for the arrival of autumn, to be let slip to scour the country. He seldom brought in large quantities at once—nor did I want them; but what he did bring were magnificent fellows, such recruits as are not easy to enlist at present.—One evening he came to me out of breath, but radiant with triumph. From a small bundle of clean, well-rooted dog-roses, he selected one, and waived it in the air, as a theatrical fairy waves her wand. "This, sir," he said, "cost me three whole days and part of a night; but I was determined you should have it. I had known of it all summer long, in a retired corner of Squire Preservem's park, and I had no need to tie a knot in my handkerchief, to bear it in mind. But the other day they warned me off the land; they thought I must be a poacher.—They wouldn't believe me, and treated me as a liar, when I said that I only wanted to stub up a few old briars for a gentleman of my acquaintance, to change into roses. But I watched my opportunity, and took it at last. I crawled up one ditch, down another; wet or dry, was all the same to me. I lay squat for hours in a bed of nettles, and afterwards crept on all fours through a thicket of furze and holly bushes. Never mind that; here it is, at last. Isn't it a beauty, sir?"

It was a beauty. The following summer I headed it with that bright-checked gallant, Brutus or Brennus (for he is so doubly christened,) who grew, and grew, till he formed a shade beneath which I could sit in my garden-chair.

In a few words, I will let you into the secret of converting a brier into a standard rose; but still, you must take lessons of some obliging friend, like mine. You must see the thing done, and then practise it yourself on the first straggling hedge-rose that falls in your way. Note, too, that cherries, peaches, and apricots may be budded in the same way as roses.

Your pupils arrive, in autumn, at your seminary for young roses. You will have previously engaged a sufficient number of what the French call tuteurs, tutors, or stakes, to support them in an upright course of behaviour. Arrange them into forms, or classes, according to height. Inspect carefully their lower extremities; remove all corns, bunions, straggling roots, and whatever is likely to sprout into proud flesh, or suckers. Plant them at exactly the same depth as you observe them to have grown in in their native site. Fasten each individual stock either to a stake of its own, or to a long horizontal twig supported at each end by two upright posts. They will thus pass their winter vacation, though they will not remain absolutely idle; for they will be making themselves at home and pushing root-fibres at times when you believe them to be fast asleep. In spring, watch the swelling buds that show themselves the whole way up the stem. When they are about a quarter of an inch long, cut off all but two, which will be allowed to grow, to be budded, at the height required. Of course, select strong, healthy buds, as near to and as opposite to each other as possible. Into these the whole vigour of the brier will be directed.

In July, after a thunderstorm, or when the ground has imbibed a soaking shower, some kind friend will send you a twig of a matchless rose. Take it into your left hand, look out for a plump, healthy, dormant bud; cut off the leaf, leaving half-an-inch of the footstalk; insert your knife a quarter or a third of an inch above the bud; cut downwards, and bring it out a quarter of an inch below; remove with your thumb-nail the woody portion, leaving a small shield of bark with a bud in the centre. This is the bud you want to make grow on your brier. To keep it moist, while you are preparing its new resting-place, you may drop it, if you like, into a glass of water; a snugger and more convenient receptacle is at hand—your mouth.

On the branch to be budded, make two slits in the bark like the two straight lines which form the letter T. The perpendicular stroke will run along the branch and terminate where it springs from the main stem; it must be a little longer than the bud you intend to insert. The horizontal stroke will be formed by a cut across the branch, and must be a little wider than the bud you want to put in. You must just cut through the bark, without dividing the wood beneath.—Cut those slits with a pen-knife on a piece of paper, or on any fresh twig whose bark peels readily, and you will instantly see what their object is. With the handle of your budding-knife gently push or lift the bark on each side of the perpendicular slit, or stem of the T. so as to cause it to rise. Or you may do it with your thumb-nails. As fingers were made before knives and forks, so thumb-nails were invented before ivory-handled budding-knives. Do nothing that can injure or irritate the interior of the wound. If you poke inside it for half an hour, and plough up the skin, you will injure its delicate organization, and in nine cases out of ten you may whistle for your bud. Instead of that, the bark once raised, take the bud out of your mouth, and slip it in gently till it reaches its place. Be as quick as if you wished to spare your patient's sufferings. It really is a surgical operation. The bud once settled between the divided bark, bind up the wound with ligature of softest lamb's wool. If you have not been clumsy, the bud will grow; and then you must unbind it, and let nothing else grow on the briar either at top or bottom. At the end of two or three summers you will have a handsome-headed rose-tree, from which you may gather basketsful of bouquets, if you prune it properly—sometimes if you abstain from pruning it.

The other day I saw an outer barbarian clipping the head of a standard rose with a pair of shears. I thought, and was very near telling him, that he deserved to have his own nose thrust between the blades.—There are roses, such as the old unrivalled cabbage yellow, and the pretty little Banksias, with their white or nankin-coloured tufts of tiny violet-scented flowers, which, I believe, cannot bear even the smell of iron. They will refuse to flower if you come near them with a knife in your pocket, even if you do not take it out and open it. You may get rid of their dead and used-up wood as well as you can, by breaking it off; but the scent of steel agrees not with their constitution. What becomes of them, then, when they fall into the hands of these merciless butchers and assassins of roses?—Many other roses, and exquisite ones too, if cut too close back, will produce nothing but leaves, year after year. Fearfully numerous instances of this wanton ill-treatment may be seen in the suburban villas that swarm round large cities, where simple people get ignorant jobbing gardeners to prune their roses by the year. But rose-pruning is a fascinating amusement which grows upon you, like billiards or chess; and I had as soon engage a fellow to eat my dinner, take my walks, or perform any other pleasurable action for me by the year, as prune my roses. It is true, different roses require different pruning, and you say you know nothing of the art. Never mind. Try. By entering thus into intimacy with your roses, you will become acquainted with every phase and condition of their existence. You will learn to distinguish one from another by the look of the twig, as well as by the aspect of the flower. Your humble servant would readily name a hundred varieties of roses, on being shown a handful of leaflets, trimmings, and prunings. That, however, is nothing.—Doubtless, Rivers, Paul, or Mitchell, have men in their employ whose more practised eye would extend the list further. One of the great hyacinth rearers in old times, in Holland, has asserted that he could recognise, by the bulb, almost every variety out of a collection of two thousand!

The sports of roses deserve to be mentioned, because several beautiful varieties have resulted from their antics. The New York and Lancaster will now and then bear blossoms one half side of which is white, the other half red. The common Provins took it into its head to send forth a branch bearing the crested Provins, which the art of budding has rendered more or less permanent. The darling little moss Pompone metamorphosed itself out of the common Pompone (itself a miniature beauty of the highest merit,) some say in the neighbourhood of Bristol, others in the garden of a Swiss clergyman. The caprices of roses must be complied with, if you would have them smile upon you. The coal-smoke of cities disgusts them utterly; the most tolerant of a highly carbonated atmosphere being perhaps the maiden's blush and the old double white. It is of little use to plant yellow roses within I don't know how many miles of Temple Bar. I have never seen that admirable rarity, the old double yellow cabbage, blossom well, except when growing at the foot of a low wall, over the top of which it could straggle as it pleased. Nor has any good been done with it by budding, that I am aware. Perhaps we have no stocks on which to bud it, but must ransack the wilds of Persia, to find them. The enemies of roses are legion. Of insect vermin the host is fearful. The maggots and worms and caterpillars and grubs which attack your heart's delight in spring, must be picked out patiently with finger and thumb. Aphides, "our little green cousin who lives on the rose," are comparatively harmless. A thunder-storm proves an excellent preventive; but thunder-storms are not always to be had at command. I take the tip of each twig in my hand, and brush off the clustering parasites with a painter's brush. An amateur (who deserves to be looked upon favourably,) has invented a double aphis-brush, closing with a spring handle, which, says the advertisement, in a very simple and easy manner, instantly cleanses the rose from that destructive insect the green fly, without causing the slightest injury to the bud or foliage. Finally, encourage lady-birds and the sightless grubs of lace-wing flies, which latter though blind, find out the succulent aphides, and instead of reserving them to act as milch-cows, pump them dry at once and throw away the empty husk, exactly as you would treat a St. Michael's orange.

There are roses which ought to make more way than they do—they are too shy, retiring, and perhaps fastidious in their habits. The microphylla, or small-leaved rose, bears most voluptuous flowers amidst delicate foliage; yet it is, like the cuckoo bird, seldom seen though often heard of. The multifloras, a charming family, comprising the seven sisters, would gratify us by making more frequent public appearances. The white Chinese anemone-flowered rose is all that is simple, and pure. It is clear that certain roses have suffered somewhat, both from evil tongues as well as evil eyes. Listen to the indignant complaint of that high-spirited horticultural traveller, Robert Fortune. "In the first volume of the Journal of the Horticultural Society I noticed the discovery and introduction of a very beautiful yellow or salmon-coloured rose. I had been much struck with the effects produced by it in the gardens of North China, where it was greatly prized, and I had no doubt that it would succeed equally well in this country. But from some cause—probably ignorance as to its habits or to the treatment required—my favourite wag-jan-ve, as the Chinese call it, was cried down. It had been planted in situations where it was either starved or burnt up; and in return for such unkind treatment, the pretty exotic obstinately refused to produce any but poor miserable flowers. Then the learned in such matters pronounced it quite unworthy of a place in our gardens amongst English roses; and I believe in many instances it was either allowed to die or dug up and thrown away. Five or six years had elapsed since the introduction of this fine climber, and it had never been seen in its proper garb. But the results in two places proved it to be a rose nearly as rampant as the old Aryshire, quite hardy, and covered from the middle of May, with hundreds of large, loose flowers, of every shade, between a rich reddish buff and a full copper-pink. The old standard plants in the open ground were one mass of bloom, the heads of each being more than four feet through. The successful cultivators would inform you that no great amount of skill was necessary in order to bring the rose into this state. It is perfectly hardy, scrambling over old walls, but it requires a rich soil and plenty of room to grow. The Chinese say that night-soil is one of the best manures to give it. Only fancy a wall completely covered with many hundred flowers, of various hues—yellowish, salmon, and bronze-like, and then say what rose we have in the gardens of this country so striking; and how great would have been the pity if an introduction of this kind had been lost through the blighting influence of such ignorance and prejudice, as have been shown by the person to whose care it was first intrusted." I have eased my mind by speaking a word in favour of ill-used, mismanaged roses. I will now mention a woeful blank which some enterprising rose-raiser ought to fill forthwith; we sadly want a thoroughly double Austrian briar, with the petals orange-scarlet above and yellow beneath. The desideratum only bides its time.

As to gathering roses;—when you wish to offer your affianced love something as charming and as fresh as herself, avoid making the attempt in windy weather. If a gentle shower will not come to your aid, water liberally all day long. Next morning, at three o'clock, or a little before, turn out of bed and cut the choicest specimens,—none of them more than three-quarters opened,—before the sun has had time to kiss the dew off their leaves. Arrange according to your own, and your Dulcinea's fancy, and tie with a true-lover's knot of blue satin ribbon. When done, put the bouquets, in water, in a cool, unoccupied room, with the blinds drawn down, till the moment arrives for the roses to appear in the divinity's presence.

Every one is acquainted with the French fashion of decorating graves with flowers. The way in which those flowers are generally respected, is an equally well known fact. But every body does not know the severity with which any violations of the little grave-gardens are punished. The Moniteur for September the twenty-second, eighteen hundred and fifty-two, states in its police report, that a woman named Badé, employed to keep up the flowers on a certain tomb in the Cimetère du Sud, conceived a singular method of fulfilling, without cost to herself, her office, which was liberally recompensed. Two handsome rose-trees, which overshadowed this tomb, withered and died. Shall she go and buy others to replace them? By no means. She remembers that, on another grave some distance, there are growing two magnificent plants of the same species. She takes them up; steals them; and employs them to adorn the grave which is entrusted to her care. The guardian of the Cemetery had already noticed a similar abstraction on the part of that bad woman. A complaint is made, and she gets for her pains—a year's imprisonment! Better law this, I think, than we usually get at home. Dear reader, I write as one—may you not read as one!—who has put Roses on the graves of the beloved.

A beautiful oriental proverb runs thus:—"With time and patence the mulberry leaf becomes satin." How encouraging is this lesson to the patient and desponding! And what difficulty is there that man should quail at, when a worm can accomplish so much from a mulberry leaf?

The secret pleasure of a generous act is the great mind's great bribe.—*Dryden,*

The Southern Planter.

RICHMOND, VIRGINIA.

Puffing vs. Advertising.

We copy from our neighbors of the "*American Farmer*" their Editorial on a subject in which all agricultural Editors are alike interested. It expresses precisely our own sentiments, and we shall follow suit, that we too may "show our hand," that subscribers and advertisers, may know what our course is, and will be, in reference to articles occupying the space in our columns devoted to reading matter. We have never received one cent for anything published *there*—while we have always charged certain rates for every advertisement inserted in our sheet devoted to that purpose. This is the proper place for advertisers; nor can we afford to let them occupy any other part of our paper.

We take it for granted that each one of our readers has caution and good sense enough, to look well into the merits of all articles presented by vendors to their notice, before purchasing them, and is capable, consequently, of protecting himself, in most instances, from being *humbugged*. We certainly do not expect to be held responsible as the endorser of each and every advertiser. We expect our advertising sheet to be filled up by persons wishing to make public the quantity, quality, and variety of wares which they wish to sell—but every man is expected to put his own value on the advertisements he reads, and determine to buy or not, as his own good sense may dictate.

We do not intend, nor can we afford, to pay the printer's bill for an advertiser's benefit—thus giving *him* the benefit of a "quasi-editorial endorsement," while *we* "pay the Piper."

These remarks are called forth by present circumstances. We have lately received a long advertisement from parties interested in the manufacture of a certain article, (of which we have never used one pound,) with the request that we would "copy." No doubt by our compliance with so unreasonable a request, *they* would, to a certain extent, be benefitted, while we would have the costs to pay and the responsibility to bear, which belongs exclusively to, and must remain with them. While we are no believers in "one-sided bargains," we must announce our readiness, at all times, to do anything in our power, that is just, and of "good report," to promote the well-being, happiness and comfort of any of our fellow-men.

We have, during a part of our previous life, had the good or evil fortune to practise physic in a large country neighborhood. In this position we acquired as large an experience as we desire to possess, of the comforts and profits derived from "working for nothing and finding yourself." For instance, we have carried our disposition to accommodate other people, so far *as to lend our tooth-drawers to a man, to pull his own teeth*—uncomplainingly giving up our own fee in the case. We think this is going far enough, and as we wish to retain possession of our molars, and to have employment for them too, we cannot consent to furnish the instruments for their extraction, merely for the amusement of other folks.

We hope, therefore, that all advertisers will in future be willing to pay their own way into public notice, and to shoulder their own responsibilities.

ADVERTISING *vs.* PUFFING.

We have received from a gentleman, a city paper, containing a favorable notice of an article of merchandize, in which he is interested, and marked "please copy." With a disposition to oblige every body, as far as we can, there are reasons why we must decline applications of the kind, and not to appear unreasonable or disobliging, we will give them.

First—a due regard to the prosperity of our advertising columns forbids, that an article, which is a legitimate subject of that portion of our publication, should be inserted as reading matter. To copy such an article as a matter of interest, and thus give it a *quasi* endorsement, would be worth much more to the party interested than an ordinary advertisement, and *much less* to us.

In the second place, our readers have a right to infer, that whatever we present to them in our columns of reading matter, is, in our opinion, of sufficient interest to command their attention, and if we, as a matter of favor, insert a special commendation of one super-phosphate, for instance, or one plow or implement, to the exclusion of others, we not only do injustice to others, so far as our opinion is worth anything, but allow a false inference as to our estimate of its value.

In the third place, we abominate the practice of "puffing," and will allow no man to stand behind our editorial chair, for the purpose of "blowing" his wares into public favor. An advertisement, where a man in his own name offers his goods to the public, is a fair, open, legitimate transaction. The party interested says what he has to say, or what others have said, in favor of his goods. No one is necessarily misled by it, even if it is over-colored or untrue; because the very type gives him warning that he is to be on his guard, to discriminate between the absurd exaggerations of flash "catch-pennies," and the sober man of business, who, in the consciousness that he has an article of substantial value for sale, is satisfied to say what he has to say, without designedly overstating or unduly exaggerating its merits. But an advertiser who "climbs up some other way" into notice, and gets the editor, either for pay or favor to say for him, what he thinks might not be believed or attended to as coming from himself, does, in our opinion, what he ought not to do. He intends to make a false impression on the public mind, that there are peculiar merits in his merchandize, which challenge the spontaneous notice of intelligent and disinterested parties. This we call "puffing," as distinguished from advertising.

We wish our own course to be distinctly understood on this point. We have not unfrequently had it suggested as a legitimate business transaction, that a favorable editorial notice would be paid for as an advertisement. The answer to this is, that when a matter of the sort is, in our view, of sufficient interest to put into the body of our Magazine, it is our duty to put it there, and we would not, of course, receive pay for doing so. If it is not of such interest, it is an imposition upon the reader to have it there at all. If it conveys a false impression of the editor's opinion, it is a fraud. The only value of such a notice, is in the reader's reliance upon the candor and good faith of the editor; and it would be a gross abuse of that confidence, to subject his opinions to any such bias.

While our rule, therefore, does not exclude a proper notice of new and interesting matters of merchandize, under no circumstances do we, or will we, for any consideration, take advertising matter to appear in any other than our usual advertising type, or receive compensation for one line that goes into the body of our Magazine.

Home Embellishment.

It gives us great pleasure to witness any and every attempt to improve and adorn the country homes of our own State. While, to us, she is more attractive than any other in the Union, and we are proud to claim her as "mother," still, we should love her none the less for devoting somewhat more to her *dress* and *appearance*.

We have never felt it possible that any one could enter into, and participate in, the enthusiasm and effection for *home*, as described by the poet in the beautiful old song "Sweet Home," who was the occupant of a dismal, lonely, dilapidated and uncomfortable house. Such an one, if he can believe "there is no place like home," must find its delights solely in the feeling of independence he there experiences, and which he might express "my right there is none to dispute." Certainly there can be no pleasure to anybody in witnessing the want of taste, convenience and adaptability, so often conspicuous about the residences of farmers who can afford to do better. We are no advocates for *mere display*, of any kind; but we like to see some attention paid to beauty in building a house, when this can be secured without any sacrifice of important features of utility and purpose, or proper regard to economy.

We, like most others, must confess our fondness for "creature comforts," and this, perhaps, may be a sufficient reason why we should urge upon our readers more attention to the subject of building than it has hitherto received. But there is a *reason*—a good one too—why many of the old-fashioned structures should be altered, or at least have no imitators, viz: a residence in a house, badly ventilated, is injurious to health, the best boon of a good Providence. Pure air is vitally essential to comfortable life. Little share of air, fit for breathing purposes, can be secured in a low-pitched, small room. In such rooms, the air is breathed over and over again, to the injury of its occupant, and the rapid diminution of his stock of "*good blood*," and nervous energy. Into such buildings disease is apt to enter, and to find there a ready coadjutor of his attacks. Good chimneys, too, are a most essential item of a comfortable house, as well as large windows. A smoky house would destroy not only the eyes of the inmates, but the temper of an angel. As an evil, it has ranked always with a *scolding wife*. Of course, none but "Benedicks" can appreciate the force of the comparison. May it never fall to the lot of our "worst enemy" to possess them both at the same time.

Again—surrounding objects exert, to a greater or less degree, their influence on the mind. Witness the effects, upon most people, of an evening's walk through a grove of pines, with the wind sighing and moaning through their branches. Under such circumstances, it might be said of almost any man, that "Melancholy had marked him for her own." But the same person, in a different place, taking in at a glance the various beauties of a landscape, neat houses beautiful trees and smiling flowers—breathing an atmosphere warmed and purified by th bright rays of a genial sun, would be cheerful in feeling and thought. Delights for the eye tend to promote a happy gaiety of disposition. It is natural to admire the beauties of nature—those of art, deserve appreciation and imitation.

Home, of all places, should be the most attractive. Nothing should be left undone to make it so. While it is well to be serious sometimes, *gloom* should be banished from the domestic hearth. There should be the shrine of innocent gaiety, to which every member of a family should bring his offspring.

"Do not keep a solemn parlor," says Ike Marvel, "into which you go but once a month with the parson, or Sewing Society. Hang around your walls pictures which shall tell stories of mercy, hope, courage, faith and charity. Make your living room the largest and most cheerful in the house. Let the place be such, that when your boy has gone to distant lands, or even perhaps he clings to a single plank in the lone waters of the wide ocean, the thought of the still homestead shall come across the desolation, bringing always light, hope, and love. Have no dungeon about your home: no room you never show: no blinds that are always shut."

"Whatever leads man to assemble the comforts and elegancies of life around his habitation, tends to increase local attachments, and render domestic life more delightful: thus not only augmenting his own enjoyment, but strengthening his patriotism and making him a better citizen. There is no employment or recreation which affords the mind greater or more permanent satisfaction, than that of cultivating the earth and adorning our own property."

Cottage Homes.

Home, Jan. 10th, 1859.

Mr. Editor:

Taking a deep interest in your valuable publication, we wish to call your attention to a subject that never fails to interest and excite our feelings. We are much pleased to see the gradual improvements in farming in this beloved land of ours. But why is it that so little is done for the "Cottage Homes of Virginia" in the way of embellishment? You may drive to houses through fields (thanks to the use of guano) as green as Erin, but will be pained to see unsightly enclosures, broken down, or perhaps none at all. The steps wanting repair, and things about the premises having a "Castle Rack-rent" look, that give no promise of the comfort within doors, the good cheer, and warm-hearted hospitality which greets you at every homestead.

Mr. Editor, we like the simple style of living in the country homes of Virginia. The extempore ways which will make a gentleman ride a mule instead of a saddle-horse, rather than stay from church,—and gentlewomen, never thinking themselves compromised by riding in a cart if the carriage is away. We wish to see progress in attention to turf, and trees, and beautiful flowers, which are as free to the poor as to the rich, and which beautify every dwelling however lowly its inmates.

These things belong not only to the "Palace Homes" of Virginia, those noble relics of olden times which we admire and love, without one spark of envy. If you can stir up your readers to bestow greater attention to this subject, which has the power to make home attractive, and to refine, elevate, and purify the heart, you will make your mark on the age in which you live, and we will honour you as a benefactor to your native State.

These improvements cost little money, and amply repay any expenditure of time and taste, which is one of the wants of the age. Let the poor man go to the forest, and remove carefully, at the right season, the beautiful trees which a kind Providence has bountifully supplied us. Let him aid his wife, mother, or sister, in her endeavours at raising flowers, however simple they may be. We honour every such attempt, if it be only a Hop-vine or Convolvolus, or even a Marygold, growing in a tin pan for want of a flower-pot.

Hoping you will excuse the warmth with which we have written, and give a corner to this subject,

We remain sincerely yours,

St. Martin's Parish, Va.

Plowing and Plowmen.

Now that the time has arrived when all the team of the farm will be employed continually, it will be well for each farmer to look closely into the manner in which this work is done—that neither the land nor team may suffer from hard usage, and improper treatment. We take it for granted that every man who knows the importance of attending to his own business' interests, will see to it, that his land is no. plowed too wet, and that the furrow slice is ent tirely cut loose and turned over, so as to ensure as thorough pulverization as is practicable with the plow alone.

But we have not as much faith in their probable practice, so far as keeping a strict eye to the necessities, and comforts of their team is concerned. While we know that every plowman will do his duty more thoroughly, if he is looked after by his employer—every man has not an eye *for* a horse, nor *to* a horse either. Many persons use and abuse them—taking no care of them after work hours. We recommend, therefore, to look closely into the condition of the gear—collars especially—and back bands. See to it that the first are not too large, or you will have a used up team, from shoulder bruises and "Swinney." Keep the collars free from any accumulation of sweat and hair upon the inside. Scrape them off clean, and oil and beat them, until the surface which goes next to the shoulder of the horse is soft. Don't allow your plowman to slip the back-band too far back of the shoulder, especially as the means of preventing the plow from "going too deep in the ground." It is a usual thing to do this; but it is death, (in the course of time,) to horse-flesh. If the horse is tolerably formed, the centre of motion will be just behind the shoulder-blade. There will be the strongest point to bear up against weight and pressure—while if the back-band works nearer to the "quarters," the nearer it does, the harder is it for the horse: he will be liable to greater fatigue, and a difficulty in bringing his hind feet well up under him. When the teams are brought to the stable, they should have at least enough currying to "straighten the hair," and remove the conglomerations of dirt and perspiration: But the more rubbing they get, the better they thrive. "Rub him hard, his skin wont come off," while the process brings about an equal, general circulation of the blood through his tired muscles, keeping up thus, health and nervous energy.

Bathing the shoulders in cold water will harden the skin, so as to prevent any abrasions of it by the collar.

The ankles should be kept perfectly clean: the fetlocks cut off, and if you should find any of them with scratches, make up the following ointment, and use it by rubbing over the ankles after having washed them well. Our word for it, it will soon make a cure:

Soft soap, ...	2 parts.
Sulphur, ...	1 part.
Lard, ...	1 part.

The next thing to be considered is the proper feeding. Those who may have reconciled it with their system of economy to have saved it, and consequently have a plenty of nice, well-cured fodder, or may have a good supply of hay, and a well stored corn-crib, need little instruction on this head. To them we can only say, feed with a *liberal* hand. Your generosity in this respect will cause you no loss, by the time the season for hard work is over. You will be amply repaid for your expenditure, in the increased efficiency, (to say nothing of the improved appearance,) of your team.

Feed at *regular hours*, and change the food as much, and as often, as the resources of the farm will allow. Don't forget to give your stock of every kind *green food*, as soon as you can procure it. Several acres planted in "Chinese Sugar Cane," will furnish a large quantity of green food of the very best quality, for all kinds of farm animals. We refer to the interesting article of our contributor, in the February number of the Planter, signed "Stover," on this subject. In the absence of green food, give your mules and horses some wheat bran, to open the bowels, and act as a "refrigerant" to the system. A few carrots given every day, will greatly aid in keeping them in health and good condition. Their beneficial effects are speedily manifested in the softness and gloss of the coat, and the looseness of the hide.

Keep an ample supply of air-slacked lime, mixed with two thirds of its bulk of salt, within reach of your horses, or give them a handful of the mixture several times a week, in their food.

An old friend of ours has been in the habit of keeping a small trough, (nailed to the manger of each horse,) filled with this mixture, for many years. He has had scarcely ever a sick horse, since he commenced the practice of allowing them access to lime and salt, whenever they pleased, while his teams attract very general remark, for the superior condition in which they are kept.

Edney's New American Pump.

(PATENT APPLIED FOR.)

In our advertising sheet will be found a drawing of this Pump, with Mr. Edney's advertisement. We got one of them from him, which we have put into operation on our farm, and like it so far very much. It brings up a *continuous* stream of water, with little or no labor to the person working it. If it shall prove durable, (and we see no apparent cause why it should not,) it must meet with a ready sale, and speedily grow very popular.

New Wheat Drill.

Our friend, George Watt,—the *Plow man*, as he calls himself,—showed us, a few days since, a Patent for a new Drill, which he has just gotten out. From the drawings and description, which we examined, we think it a "good thing." The Drill has some entirely new features—one of which is, that no part of a stubble, which has been plowed under, can be dragged up, while the seed sowed will be covered as deeply as is usual with any other Drill. He expects to get Messrs. Samson & Pae to put up some of them as soon as possible. Their manufacture by these gentlemen will be a guarantee for the excellence of their construction. While *we* have such confidence in the mechanical ingenuity and practical good sense of both Messrs. Watt and Samson, that we should feel very well assured, if *they* pronounced the Drill a good one, that "there is something in it." It has a guano attachment.

Tobacco-Handler.

A gentleman from Powhatan county, Va., has showed us a model of a simple and effective machine for putting the bundles of tobacco into good shape before prizing. It works admirably, and as soon as he receives his Patent, (applied for,) we shall have one at our office, open to inspection, together with some tobacco which has been subjected to its operation.

Anecdotes of Love. By LOLA MONTEZ, Countess of Landsfelt.

We are indebted to Messrs. J. W. Randolph & Co., for a copy of this new and amusing work, which is the last production of the well-known authoress. It seems to be a record of the doings of the "little god" for a "*considerable*" time past, and will serve to make more of his pranks known to the public, than he ever had exposed, at one view, to their scrutiny before.

Our New Office.

Our country friends will find us at the old stand of Messrs. Baldwin, Cardwell & Co., on Main street, opposite to Messrs. Kent, Paine & Co. We will be glad to see them there whenever they may choose to "drop in," and can safely promise (unless they have a note to pay) to make them feel at home, and comfortable.

Articles intended for publication in our paper should be marked, "For the Southern Planter."

Do not write on both sides of the paper. If this rule is not regarded, mistakes are very apt to occur in printing.

Green Food for Work-Horses.

We trust our readers have not regarded the able and instructive communication of our correspondent "STOVER" on "*Sorghum and other substitutes for Blade Fodder*," which appeared in our February number, as of that ephemeral character, which they might dismiss from their thoughts as soon as read, or retain in their memories only for a day.

Far, very far different is our estimation of it. We regard his suggestions as of national importance.

Their full adoption into general practice throughout the State, would inaugurate a new era in Virginia husbandry by adding hundreds of thousands to the annual profit of our agriculture through the retrenchment of expenses effected in this one branch of farm economy—namely: the maintenance of our teams. And not simply their maintenance—but, as compared with the present system, a decided improvement in their condition, rendering the application of their power the more effective in proportion to their gain of strength and endurance in the performance of their labor, heightened by the increased activity and sprightliness of their movements resulting from the healthful effects of the larger amount of green provender afforded them. With these views of the importance of green food for work horses, we suggest for the consideration of our readers the importance of arranging ther plans for the present season so as to secure a sufficient variety, and regular succession of green crops for the use of their teams during the progress of the season. Those who have a field of rye for this purpose already on hand, have a good resource to begin with; clover too, will hold an important place in the general arrangement; in addition to this, sorghum may be planted, at different dates, so as to secure successive crops adapted to different stages of the season, oats may be sown in like manner, for the same purpose, and so also of Indian corn, millet, &c., &c.

We conclude these brief suggestions, with the following interesting letter addressed by a gentleman in Georgia to his friend in this city, which will be found to corroborate the views expressed by Stover, and to enforce the recommendations we now submit to our readers:

MY DEAR SIR:—I informed you last summer of my enlarged experiments this year with the Sorghum or Chinese Sugar Millet, and also promised to inform you of the results. All my expectations have been realized, both for Syrup and Forage, and in some respects exceeded. I plant in latitude 33° 30′ in Central Georgia. I this year planted 50 or 60 acres on all the quality of land in my farm, from rich creek alluvions to my most exhausted uplands—all did well—produced a more luxuriant crop than any other plant I cultivate on the same kind of soil, and on exhausted soil a much heavier crop than I supposed the soil capable of producing in any thing, even peas.

I planted at different times, from the middle of March to the 17th of July, it all matured, but the late planted did not bunch so much as the early. After ridging up and planting, it requires about half the amount of culture that corn does, and I think produces about double as much of forage for stock as corn does per acre, and matures two or three weeks earlier than our common crop corn, and if you can get a stand, it will grow and mature with almost no rain. It also grows well on land too moist either for corn or cotton. I have been feeding my hogs, horses and cows on it almost entirely since the first of August, and never had them to thrive and do better, and no deaths have occurred that I could trace to the Sorghum. I planted also 7 different varieties of the African Millet or Imphe. I have thrown all that away as inferior to the Sorghum except one, a white seeded millet that I am going to try this year as a bread corn—(we will see,) I have now, I think, an abundance of millet forage to carry my stock through the winter, and then seed enough to mix in the corn half and half to feed my work stock 10 or 12 weeks next summer. In the summer I grind the corn and millet seed and feed it on cut stuff. In this way I fed millet seed last summer with the most satisfactory results. I feed about 150 head of stock cattle, but the cows also have the corn shuck, and do not appear to be so fond of the millet as my other stock. I think it peculiarly valuable to feed to hogs and horses not at heavy work, but some of my neighbours have fed their riding and work horses with *it alone, and they say they stand work as well as when fed on old corn, but then the seed and stalk should be fully matured and fed together.* I don't think the plant is nourishing and probably not healthy *for stock* until the seed and saccharine matter are matured. It will wait on you in the field to cut for either forage or syrup 6 or eight weeks after the seed is fully hard, and for syrup I think it improves for 4 or 5 weeks after the seed have dried. The sap diminishes, and it requires less hauling, and I think the syrup has less of the peculiar vegetable matter.

I made this year 12 or 13 hundred gallons of the syrup. The apparatus, an iron mill, 2 rollers 12 inches long and 12 inches in diameter, and 4 shallow iron kettles holding about 60 gallons, each put up in furnaces. (I would prefer the kettles to hold 75 gallons.) The stalk has the tassel and seed cut off and stript of the fodder, then cut and hauled to the mill, and pressed through the rollers, strained and emptied into one of the kettles over a slow fire until the kettle is full. By that time there will be a thick skum on the top, skim that off and then kindle a strong fire and boil it as rapidly as you can, stirring it all the time, and the faster you boil it the better the syrup. Say boil it down to 1-6th in four hours, and if your cane is dry and fully matured, it will at least make 1 gallon of syrup to 6 of the juice, if sappy and green about 1 to 7 or 8. My mill expresses about 300 gallons of juice in the day, and that makes from 45 to 60 gallons of good syrup according to the condition of the cane. The 2d, 3d, and 4th kettles are filled and disposed of in the same way, and I think dry, sap-wood that will make more blaze is much better to use as fuel than hard wood, the heat is too intense from the hard wood. All my syrup this year is depositing quantities of crystalized sugar, and I have no doubt an economical mode of making sugar from it will be discovered yet.

I have planted the Sorghum 4 years, and my experience has drawn my attention to another idea. In a rotation of crops in restoring the peculiar fertility for other of our cultivated plants, it may turn out valuable as it feeds on and develops sugar or elements not used by our other cultivated crops. (We will see.) My observations this summer in the mountains of Tennessee and Virginia led me to think that it does not grow so luxuriantly there as here. If it does it will be immensely valuable *as a forage crop*, and also for syrup, as they can make it at a leisure season of the year, and save the expenses of transportation. You see I have given you my experience and my conclusions as short and as clear as possible without any effort at composition. I have striven more to be accurate than elegant.

Kind regards to yourself and family,

I am, dear sir, yours truly.

P. S.—I plant my seed thick enough to be sure of a stand, and let it stand until the plant is 6 or 8 inches high before I touch it, I then plow it and have it thinned out to a stand about twice as thick as I would leave cotton, and when 20 inches or 2 feet high, I plow or sweep it again just to clean it, and if thick enough, do nothing more.

A beautiful oriental proverb runs thus:—"With time and patience the mulberry leaf becomes satin." How encouraging is this lesson to the impatient and desponding! And what difficulty is there that man should quail at, when a worm can accomplish so much from a mulberry leaf?

For the Southern Planter.

Tobacco, not Necessarily an Exhausting Crop, and no Demoralizer.

[No. 2.]

Mr. Editor:

In a previous contribution to the February number of your journal, I have reviewed, in part, an article, which, attempting to prove Tobacco "the bane of Virginia Husbandry," asserts that it is the most laborious and exhausting of all crops, and that "*it is a demoralizer in the broadest sense of the term.*" Your March number contains a continuation of the article I have attempted to review. I perceive my opponent is Gen'l John H. Cocke, of Bremo, one of the best farmers in the State; but the *identical gentleman*, to whom I have alluded as being possessed of an "Alabama adjunct" to his estate here, which enables him very well to dispense with the cultivation of tobacco in Virginia.

So far as relates to the charge, that tobacco is the most laborious of all crops, I have already shown, that this labor is so diffused throughout the year, as to be at no time oppressive, and that notwithstanding the care and labor incident to its cultivation, it PAYS better than any crop yet attempted in Piedmont and South-side Virginia. It has also been proven, by the testimony of all unprejudiced observers, that it is not necessarily an *exhausting* crop, but made so by *land-skinning* Vandals, who ignore rotation, and all means of keeping up the fertility of the soil, it matters not what be the staple cultivated. Your correspondent has sought to establish, that tobacco "is a demoralizer in the broadest sense of the term," that its cultivation involves labor that is oppressive on the producer, and that the effect of such cultivation, is to exhaust, and reduce to sterility, those sections where its cultivation obtains. Were these assertions unheard *beyond* the tobacco-growing region, they could produce no harm. *But*, when a writer of ability, and a resident of Virginia, known throughout the North, attempts to prove, through your journal, that *Southern men, with slave labor*, are *systematically* exhausting and impoverishing whole counties; that they are doing this by an unreasonable exaction of labor from their slaves, and that their energies, thus improperly spent, are employed in the cultivation of a poison, a "demoralizer in the broadest sense of the term," I cannot, though entertaining the highest respect for the gentleman, allow such unsupported assertions to go unquestioned. His strictures amount to a charge of immorality upon a large class of our rural population, which constitutes, as he has every means of knowing, one of the best elements in our social polity. He has attributed to gentlemen, engaged in the culture of tobacco, the habit of cutting tobacco *on Sunday*, to prevent damage from an anticipated frost on the Monday following; and in his last article, this is his remarkable declaration: "From time immemorial, in the history of tobacco, it has been the practice, when a moderate rain falls on a Saturday night, to plant on Sunday morning, rather than run the risk of losing the season, at a critical period of the year." This declaration is so expressed as to apply to tobacco-makers as a class. It is not confined to the few men, in every neighborhood, who habitually desecrate the Sabbath. No such system prevails. Not *one* planter in five hundred can be found, *who, once in ten years*, has been induced thus to violate the Sabbath. My associations have been with them from infancy, and I do not recollect one instance of Sabbath violation, occasioned by the crop, which any good or moral citizen has yielded to. Virginia, the enemies of her peculiar institutions have been accustomed to say, was once the mother of Presidents and statesmen, but is now the breeder of slaves. I protest against the completion of her degradation, in the eyes of Northern fanatics, on the part of your correspondent, who presents to the world this great mother of darkies, as tasking her slaves to the last limit of physical endurance, as desecrating the Sabbath, and exhausting the soil in the cultivation of "a demoralizer in the broadest sense of the term."

All the impoverished fields of the Old Dominion have been attributed to the cultivation, either at present, or at some past time, of this staple. But the truth is, thousands of acres, in Virginia, *have never been impoverished. They have been poor since the Creation, and poor they will ever remain, until a redundant population, cultivating truck-patches instead of farms*, undertakes to supply what nature has denied, viz: wanting elements of fertility to the soil. Even where originally fertile, a regular diminution in the productiveness of the soil, under improper cultivation, and where no tobacco is grown, is everywhere observable. Thousands of acres in the Southern States have ceased, from this cause, to repay the cost of cultivation. Though tobacco culture is unknown in South Carolina and upper Georgia, and Alabama, their sterile districts appal the traveller, by a barrenness unknown to Virginia. Examine the statistics of the New England states, with their annually decreasing yield of wheat, mark the diminished products of even the alluvial prairies of the West, under a system which ignores drainage, rotation and rest, and you will find, Mr. Editor, that exhaustion of the soil is nowhere caused by the cultivation of any *one* staple, but by the improper cultivation of *all;* that it is due to the neglect of known laws, and to that grasping spirit, which, exacting from the bosom of mother earth all its nourishment, returns nothing to keep up its supply. A bountiful Providence, seeking to mitigate the primal cause of labor, has everywhere provided remedial agents for the resuscitation of the soil, but ignorance and folly reject the boon, and are finally forced to leave their country "for their country's good." Such was the case in Tide-water Virginia. A few years ago it was a wilderness for miles. Broom-sedge and stunted pines had usurped the land; its population fled in dismay from a country which seemed to be under a curse, abandoning their homesteads, or selling them for a pittance. Yet underlying these deserted farms, were inexhaustible supplies of marl, which it was only necessary to apply to restore them to fertility. When that man, Edmund Ruffin, whom I honor more than the whole race of Virginia politicians, all put together, published his views, and the remedy which the remaining population had at hand, he conferred a boon upon Virginia, which, though for a time undervalued, entitles him, in the estimation of all, now, to the very first position among the benefactors of the State.

But to return to the objections advanced by Gen. Cocke. I will state that one of his great arguments against tobacco, that you have the crops of two years on hand at one time amounts to really nothing. If the crop is sold in winter order from January to March, the only work done for the new crop during this period, is the plowing of the tobacco land and preparation of the beds.—Farmers frequently sow their wheat crops before delivering the crop seeded the previous year, but I have never heard this presented as an argument against wheat culture. The "watching, nursing, and pushing forward of the plant beds," mentioned as one of the items going to prove the laborious character of the crop—does not usually commence until the 1st of May, and one hand, in about 10 minutes, does all that is necessary, an application of manure, or plaster, being all that is requirod. Your correspondent, in order to make out his charge that it is the most laborious of all crops, has entered into details, which include every process connected with the crop, and upon the whole, (though undesignedly I am sure) has written thus far the best essay I have ever read on the cultivation of tobacco, and is entitled to the premium offered by our Society. The history given by him of the manner of its cultivation is complete. It will be the guide of my whole future cultivation, and I recommend it to all enquirers as to the proper method of cultivating, housing and curing the crop. But as to the results, we differ. He says "Tobacco makers buy a large portion of their meat from Western drovers, and often not a small portion of their bread." In reply, I have to say, that it is well to make a crop which furnishes the means to buy bread when the seasons fail. "It rains on the just and unjust alike," and frequently for long seasons *rains on neither.* The farmer fails in corn, and consequently in meat, and has nothing to buy with, always supposing their is no "Alabama adjunct" in the case. But the tobacco planter can in unfavorable years, purchase to supply deficiencies with proceeds of his tobacco crop. He says the farmer cannot spare manure to keep a grass lot, or an acre or two of meadow. In reply, I have to say, that the best possible way to insure a stand of grass, and form a permanent meadow is to prepare the land by a crop of tobacco.—He says it is neither meat, drink nor clothing for man, nor provender for beast, and that it starves both man and beast. This remark strikes me as plausible, and to my knowledge, I do not know of its being used for the purposes above stated, but it *buys* clothing, meat and drink, it insures provender, if you will sow grass seed, and after enriching a lot with tobacco will keep it in corn. Believing that there is no force in the objections thus far urged against the cultivation of tobacco, not one of the various operations described, involving anything like the labors of the harvest field, and premising that all this labor *pays*, I urge for its continued cultivation, in the districts where it is now grown, the following convincing reasons:

1st. It is a great conservative of the institution of slavery in our State, keeping thousands engaged in its culture and manufacture who would otherwise be sold out of it.

2nd It gives employment to the farm force in winter.

3rd. Thus preventing the exposure or idleness consequent to a force not employed at all, or if employed, subjected to the weather.

4th. It is the best possible preparation for the wheat crop, and will ensure a stand of grass when every other preparation fails.

5th. It encourages the making of farmpen manures, and the husbanding of all the materials the farm affords for that purpose.

6th. It is the best of all crops to eradicate weeds and briers to prepare new land for general field culture.

7th. It is peculiarly adapted to small farms, and leads to the subdivision of estates, as the value of the yield per acre exceeds any other crop.

8th. It is a crop easy of transportation, costing less than any other to get to market.

9th. It stands drought better than any other crop.

10th. Consequently if the grain crop fails, it furnishes the means of purchase.

11th. By cultivating it, you are sustaining a vast industrial and manufacturing interest which keeps up the price of lands, and furnishes to Virginia commerce the most of its exchange upon the North and Europe; and finally, when connected with the cereals and the grasses, this system affords the largest share of comfort and profit from the products of the soil, and affords reasonable prospects of maintaining, if not increasing the productive powers of the earth for an indefinite time.

In conclusion, Mr. Editor, I hereby declare my intention, with your kind permission, to defend this much abused weed from any farther assaults of your respected correspondent. I apprehend nothing from a fair discussion of the subject, but that the arguments adduced for growing the crop, by your many correspondents, will too greatly stimulate its production, and lead to a decline in prices.

Yours, very respectfully,

J. B. McClelland.

March 10*th*, 1859.

Economical Hints.

1. Have a work bench and a few tools in your woodshed, or in a little room at one end of your barn. There are many small jobs in the course of a year, which any man of common ingenuity can do as well as a professed carpenter. And there are many rainy days and "odd spells" when these jobs can be done. And how much waiting and patience this would save!

2. Have a place for everything and everything in its place. Those tools—why should they be lying around, the auger here, the jack-plane there and the saw yonder, and the adz and screwdriver no where? Don't put away a shovel, hoe, spade or any implement without cleaning it. This may seem needless care, but in the long run it is a saving of time and money. Rust corrodes and weakens the best made tools. There are men who leave their plows standing in the furrow, or lying by the side of the fence from one year to another. And the "bran new" scythe is often left dangling from the crotch of an apple tree month after month. Hear what a sensible farmer says: "Drive in stout wooden pins to hang your yokes upon, nail strips of board from joist to joist to hang chains upon, make a rack overhead for pitchforks, rakes, turning sticks," &c. To all of which we respond, So let it be!—*Am. Agr.*

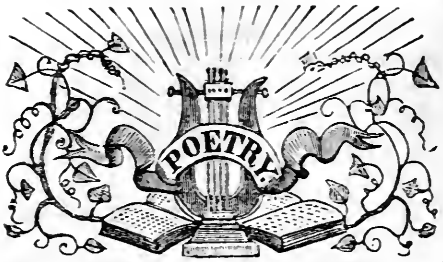
Tomato Wine.

Superior wine from the tomato is now manufactured. It is made with no other ingredients than the pure juice of the tomato and sugar, and very much resembles champagne—a light transparent color, with a pleasant, palatable flavor. It can be made equal to the best champagne.

To gain a correct acquaintance with human nature, it is not necessary to move in a public or extensive sphere. A more limited circle of observation conduces to greater minuteness and accuracy. A public mode of life is favorable to knowledge of manners; a private, to a knowledge of character.

One's breeding shows itself nowhere more than in his religion. A man should be a gentleman in his hymns and prayers.—O. W. Holmes.

The secret pleasure of a generous act is the great mind's great bribe.—Dryden.



An April Day.

When the warm sun, that brings
  Seed-time and harvest. has returned again,
'Tis sweet to visit the still wood, where springs
  The first flower of the plain.

I love the season well,
  When forest glades are teeming with bright forms,
Nor dark and many-folded clouds foretell
  The coming-on of storms.

From the earth's loosened mould
  The sapling draws its sustenance and thrives:
Though stricken to the heart with winter's cold,
  The drooping tree revives.

The softly-warbled song
  Comes from the pleasant woods. and coloured wings
Glance quick in the bright sun, that moves along
  The forest openings.

When the bright sunset fills
  The silver woods with light, and the green slope throws
Its shadows in the hollows of the hills,
  And wide the upland glows.

And, when the eve is born,
  In the blue lake the sky, o'er-reaching far
Is hollowed out, and the moon dips her horn,
  And twinkles many a star.

Inverted in the tide,
  Stand the gray rocks, and trembling shadows throw,
And the fair trees look over, side by side,
  And see themselves below.

Sweet April!—many a thought
  Is wedded unto thee. as hearts are wed;
Nor shall they fail, till, to its autumn brought,
  Life's golden fruit is shed. LONGFELLOW.

Waiting.

" Wherefore dwell so sad and lonely,
  By the desolate sea-shore;
With the melancholy surges
  Beating at your cottage door!

" You shall dwell beside the castle,
  Shadowed by our ancient trees!
And your life shall pass on gently,
  Cared for, and in rest and ease."

" Lady! one who loved me dearly
  Sailed for distant lands away;
And I wait here his returning
  Hopefully from day to day.

" To my door I bring my spinning,
  Watching every ship I see:
Waiting, hoping, till the sunset
  Fades into the western sea.

" Every night, behind my casement
  Still I place a signal light;
He will see its well-known shining
  Should his ship return at night.

" Lady! see your infant smiling,
  With its flaxen curling hair;—
I remember when your mother,
  Was a baby just as fair.

" I was watching then, and hoping;
  Years have brought great change to all;
To my neighbours in their cottage,
  To you nobles at the hall.

" Not to me—for I am waiting,
  And the years have fled so fast
I must look at you to tell me,
  That a weary time has past!

" When I hear a footstep coming
  On the shingle,—years have fled,—
Yet amid a thousand others,
  I shall know his quick light tread.

" When I hear (to-night it may be)
  Some one pausing at my door,
I shall know the gay soft accents,
  Heard and welcomed oft before!

" So each day I am more hopeful,
  He may come before the night;
Every sunset I feel surer,
  He must come ere morning light.

" Then, I thank you, noble lady;
  But I cannot do your will:
Where he left me, he must find me,
  Waiting, watching, hoping still!"

All's for the Best.

All's for the best, be sanguine and cheerful,
  Trouble and sorrow are friends in disguise,
Nothing but folly goes faithless and fearful,
  Courage forever is happy and wise.
All's for the best, if a man would but know it,
  Providence wishes us all to be blest,
This is no dream of the pundit, or poet,
  Heaven is gracious, and all's for the best.

All's for the best, set this on your standard,
  Soldier of sadness, or pilgrim of love,
Who on the shores of despair may have wandered
  A way-wearied swallow, or heart stricken dove.
All's for the best, be a man but confiding,
  Providence tenderly governs the rest,
And the frail bark of his creature is guiding,
  Wisely and warily, all for the best.

All for the best, then fling away terrors,
  Meet all your fears and your foes in the van,
And in the midst of your dangers or errors,
  Trust like a child, while you strive like a man.
All's for the best, unbiassed, undoubted,
  Providence reigns from the East to the West,
And by both wisdom and mercy surrounded,
  Hope and be happy that all's for the best.
M. F. TUPPER.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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From the Transactions of the Virginia State Agricultural Society.

AN ESSAY

On the Cultivation of Indian Corn on Clay Soils of the Valley.

[A Premium of Twenty Dollars.]

Indian corn, with its tall and tapering stalk, its rich and graceful foliage, and its soft and brillant silk, is the most beautiful, as it is the most valuable crop cultivated by the Virginia farmer. And when we remember that a large proportion of the bread consumed in this State is made from corn-meal, that corn is used almost exclusively for feeding the teams that perform the labour of the farm, that all the pork and a large amount of the beef annually made is fattened upon it; and that in addition to these various uses of the grain, the stalks and blades constitute an important and indispensable article of forage, we will be satisfied that the distinguished author of "Arator" did not overestimate its value when he declared it to be "meal, meat, and meadow."

The design of this essay being to offer a few practical suggestions on the culture of this valuable grain, I shall confine myself in its preparation chiefly to deductions from my own experience and observation.

My experience being limited exclusively to a single county, (Augusta,) it is not my intention to recommend the mode described in this paper as either original, or the best; yet a comparison of the various methods pursued in different sections of the State, may be the means of eliciting useful information upon the cultivation of this grain.

Preparation of the Land.

The first and perhaps most important step, in the cultivation of a crop of corn, is the preparation of the land for the reception of the seed. And the manner in which this ought to be done, will depend in some degree upon the character of the soil. Light and sandy, or gravelly lands, do not require the same amount and kind of labour to bring them into proper condition for planting, that is indispensably necessary upon heavy and compact clay soils.

Whilst the distinguishing characteristic of the "Valley" is its vast limestone formations, there yet exists much diversity in the soils of this part of the State.

In this county there prevails to a considerable extent, what is denominated "Slate lands," differing in some important particulars from the other soils of this section. I know not what difference, if any, a chemical analysis would exhibit between them and the limestone lands proper. Upon the slate lands no limestone is found, (or only in small quantities and of inferior quality,) they rest upon a substratum of slate, which doubtless contains a small quantity of lime, and probably a trace of magnesia. These lands differ from the other soils of the county, in being colder, heavier, more compact and tenacious. They also cover themselves more readily with a thick sod of the indigenous grasses,—the blue grass and greensward thus constituting our finest grazing lands, as is shown by the fact that cattle fatten more rapidly upon them than upon any other kind. They are likewise excellent wheat lands, the crop, however, being somewhat more liable to rust than upon lighter and warmer soils. But ample compensation is found for this drawback in the usually superior quality and larger yield of grain, and the greater freedom from the ravages of the hessian fly and joint-worm.

The limestone lands are somewhat lighter and warmer, and rather better adapted to the growth of clover than the slate lands; and upon them, in consequence of their superior warmth, corn in the earlier part of the season exhibits a larger and more luxuriant growth, but it is doubtful whether the product in grain is greater than upon slate lands of like quality.

In preparing for corn it is the usual, as it is the best method, to plow in a clover ley or sod, and in this county, upon clay lands, if they have remained unplowed three or four years, the indigenous will, in a great measure, have supplanted the artificial grasses, thereby adding to the weight and richness of the sod. There are several reasons in favour of planting corn upon sod land, where practicable. In the first place, a large quantity of vegetable matter is returned to the soil, affording an abundant supply of food to the growing crop. And secondly, upon rolling and hilly lands it affords important aid in preventing washing and gullying by heavy falls of rain during the summer, the roots of the grasses composing the sod holding the soil together, and in a large degree increasing its absorbent capacity.

In order to the successful cultivation of corn upon heavy clay lands, it is essential that they should be plowed in the winter. The process of freezing breaks down and pulverizes the tenacious clay-loam more effectually than it can be done by any mechanical means within reach of the farmer. In addition to the pulverization of the soil already mentioned, there are other reasons in favour of winter plowing deserving attention.

At that season of the year the farmer has more leisure for this laborious operation, and his teams are in better condition and more able to undergo severe labour than they are likely to be in the spring. Again, he is rarely interrupted by excess of moisture; one of the great advantages of winter-plowing being found in the fact, that the land sustains no injury from being plowed wet,—it matters not how wet so the work can be well done. There are occasionally, it is true, in the winter a day or two at a time, when the land is so thoroughly saturated with water that the work cannot be satisfactorily performed, the teams sinking fet-lock deep in the miry soil. But these occasions are of rare occurrence upon our heavy sod-lands.

But if plowing upon the heavy clay soils of the Valley is postponed until spring, it is rarely that they are in proper order for the operation more than a day or two at a time—being either too wet or too dry, and if plowed in the former condition the land is made hard, compact and cloddy; in truth it is difficult to exagerate the evils of plowing such land in the spring or summer. When too wet, and when too dry, the work can be but imperfectly performed, and that with great labour and injury to to the teams; nor can the soil be brought into that fine tilth so congenial to the corn crop. This truth was illustrated the present year in my own practice. The plowing of a lot of heavy land that had been in corn the year previous, was interrupted when nearly completed by a snow storm in February; the small portion thus left was not plowed until late in April. The entire lot was planted at the same time, and received the same culture. This fall the boundaries of the April plowing were clearly defined by the inferiority of the corn growing within them.

The pulverization of the soil by freezing is due to a property of water possessed by few, if, indeed, by any other substance. It is a well known law of matter generally, that in passing from a fluid or liquid to a solid form, its volume is diminished, or, in other words, it contracts. But the reverse of this law is true of water, it upon being converted into a solid substance—ice—expands, and that, too, with a force that is irresistible.

It is this expanding property of water in the act of congelation that pulverizes the soil. As the water freezes it expands, and necessarily separates the particles of the soil, overcoming all their affinity for each other, and leaving the plowed land light, loose and friable. This renders it entirely safe to plow, however wet the ground may be, provided freezing takes place afterwards; for the more thoroughly saturated the soil is with water the more complete will be its disintegration upon freezing. Could the soil be made *perfectly dry* freezing would have no more effect upon it than it has upon the solid limestone; and if, upon the other hand the limestone could, by any process be thoroughly saturated with water, freezing would as effectually pulverize it as it does the soil.

My practice has for many years been guided by these principles: and I have had land plowed in the winter, when in the low places in the field the water would follow the plow in the furrow; and the land, so far from being injured by it, those places were more completely and thoroughly pulverized by the freezing, and were found in finer tilth in the spring than any other part of the field.

Another benefit derived from winter plowing, is the destruction of insects injurious to the corn; the ravages of the cut-worm being in a great measure prevented by it. I had in my experience, some years ago, a striking illustration of its advantages in this particular. Part of a field of sod-land was plowed in the winter, and the remainder not until spring; all of it was planted in corn. The part winter-plowed had scarcely a hill disturbed, whilst upon the remainder of the field nearly every stalk of the first planting was destroyed by the cut-worm, and it was only after repeated replantings that a tolerably good stand was secured.

The best time for winter plowing is after the land has been once frozen and subsequently thawed. The effect of the freezing and thawing being to loosen the land, the operation of plowing can be more thoroughly and better performed, and with much less labour to the teams than it would otherwise be. And there is rarely a winter in wh ch, after the fi st hard freeze, an interval of mild weather does not occur, during which a large amount of plowing can be accomplished.

Perhaps there is no one of the multitudinous operations the farmer has to perform about which so much that is erroneous has been written as this primary one of plowing; and especially is this the case in reference to the depth at which the land ought to be turned up. Deep plowing has been indiscriminately recommended as a panacea for "all the ills" that land is "heir to," as though the addition to a soil four or six inches deep, of as many more inches of the harsh and sterile sub-soil, would make it more fertile and productive. Some amateur investigator of the curious, rather than the useful, having traced the roots of wheat or some other plant to the depth of *four feet*, this fact was at once assumed as conclusive evidence that the roots of all plants, under all circumstances, penetrated to a great depth in search of food. And the farmers were straightway told, if not literally to plow "four feet deep," yet that for successful and profitable farming *very deep* plowing was essential. It is doubtless true that the roots of some plants, under certain circumstances penetrate the earth to a considerable depth. But if either wheat or corn should, in this part of the "Old Dominion," send their roots, with gaping spongioles, to the depth of four feet in search of nutriment, they would certainly be disappointed unless satisfied with very coarse fare. My observation tends to the conclusion that plants naturally seek their food near the surface where the soil is permeable to atmospheric influences, and where they are benefitted by every summer shower, however slight. Hence it follows that it is more important to make additions to the fertility than merely to the depth of the soil. The amount of the crop being rather in proportion to the former than the latter.

Every one must, however, determine for himself the depth at which his land ought to be plowed. A rich alluvial soil, several feet in depth, might safely be plowed as deep as Professor Mapes turned up the flats of New Jersey, and a light sandy soil, upon a clay basis would doubtless be improved by mixing with it, by means of deep plowing, some of the sub-soil. But upon heavy clay lands, which are generally underlaid by a harsh and sterile sub-soil, I am satisfied it is a great mistake to plow much deeper than the natural soil. From six to eight inches is as deep as the best lands of this county ought to be plowed. And that is beyond the average depth of plowing in this section of the State.

For several years I tried plowing for corn ten and twelve inches deep, and the only benefit I derived from it was a saving of labour when I came to gether the crop in the fall,—the quantity being considerably diminished in consequence of the deep plowing. The worst crop I ever made was upon a field plowed nearly twelve inches deep. The summer, however, being very dry, it afforded an excellent opportunity for testing the correctness of one of the stereotyped reasons assigned in favour of deep plowing, viz: that it enables the crop better to sustain the effects of a severe drouth; this field, notwithstanding the deep plowing, suffered as much from the dry weather as others of the same kind of land that had been plowed to but little more than half its depth.

In plowing for corn, especially if it is sod-land, it is important that the furrow-slice should be well and smoothly turned over, as free as possible from breaks and baulks. And the best method of plowing this kind of land is, to make the furrow-slices lap over, one upon another, so that the edge or entire thickness of the slice is exposed to the weather. The advantages of this mode are found in the fact that a larger surface is subjected to the action of the frost and atmosphere, and as it pulverizes, it completely closes the spaces between the furrows, thus effectually preventing the grass from growing up between them to the injury of the crop and the annoyance of the farmer.

Just before planting time, the land designed for corn ought to be well harrowed, and more than once if necessary, to put it in good condition, it being important to the successful after-culture of the crop that the field, in the spring, should "express the full tilth and husbandry" of the farmer. I have, however, seen fields of winter-plowed land in fine condition for planting without harrowing at all.

Mode of Planting.

Upon hilly and rolling lands,—and of such is a large proportion of the lands of the Valley,—the best method is to drill the corn in rows, as nearly horizontal as practicable, for in this way the washing and gullying of the land can be more easily prevented. And if the land is free from stumps and other obstructions, it is best to use a corn-planter for this purpose; as in addition to the greater regularity with which the seed is dropped, the labor of three or four hands is thereby saved. The distance at which corn ought to be dropped in the rows, and the spaces proper to be left between the latter, must be determined by every farmer for himself. No definite and precise rule can be given for what depends upon such a diversity of circumstances. The fertility of the soil, the variety of the corn planted, and many other things, affect this question; not the least important of which is the character of the season that is to follow—(and *that* can be foreseen by no one, however sagacious,)—it being well-known that corn will bear closer planting in a wet than in a dry season.

Time of Planting.

It is a matter of some consequence to determine the proper time at which corn should be planted, but it is obvious that no specific directions can be given for what is affected by so many contingencies. All that can be done is to indicate some general principles that may aid each one in determining the proper time for himself.

Independent of all other things, the mere elevation of a section of country, or even of a single farm, has the effect of retarding vegetation in the spring, and upon such lands the time of planting ought to be postponed accordingly. This county (Augusta) being the most elevated part of the "great Valley," vegetation, in consequence, is less forward here than in other counties of the same section, lying even farther North. But the time of corn-planting in this county, has been, for a number of years, steadily becoming earlier and earlier, to the manifest injury of the crop, and an increase of labor to the farmer. Formerly, from the first to the tenth of May was deemed the proper time to plant corn. That time would now, however, be considered late planting. Many farmers commence early in April, and before the first of May the crop is generally all planted. I am not aware to what extent this practice of early planting prevails, but presume it extends over the entire Valley.

The effect of this early planting, before the ground has become warm enough to ensure the speedy germination of the grain, is that much of it does not vegetate at all, and such as succeeds after a long time in getting above ground, is weak, pale, and unhealthy looking, which necessarily imposes on the farmer a large amount of labor in replanting. Last spring, in consequence of the unusual amount of wet weather, the time of planting was postponed some two or three weeks later than usual. The good effects of the delay were apparent in the prompt and certain germination of the seed, the healthy and vigorous appearance of the plants upon coming up, (scarcely any replanting being required,) and that the maturity of the corn was not retarded by this late planting, as was shown by the fact that the crop was more forward on the first day of September than it had been, at that date, for several years.

The most unphilosophical determination a farmer can come to upon this subject, is to resolve that he will commence planting every year upon the same day. For our seasons are so variable that the same day, of the same month, may be two weeks, or more, later or earlier, one year than another, when measured by the condition of vegetation.

The proper time to plant corn is when the earth has become warm enough to ensure the prompt vegetation of the seed: and this condition of the ground is indicated, perhaps better, by the state of forwardness of the trees, either fruit or forest, than in any other way. It is said that the Indian time of planting was just as the dogwood was bursting into full bloom.—Without undertaking to assert that this is exactly the proper time, my experience and observation incline me to the opinion that it is; it at any rate points out the correct method of ascertaining it.

A farm with a Southern exposure, can be planted earlier than one with a Northern aspect; and so will gravelly and sandy, or a warm lime-stone land, admit of earlier planting than a cold, heavy slate, even in the same neighborhood. Every one ought, therefore, to determine for himself when he should plant, independent of, and uninfluenced by the practice of any other person. The worst possible reason a man can give for beginning to plant corn on a cold frosty morning, early in April, as he shivers in his overcoat, and fires have to be kept in the field for his negroes to warm their fingers at, is that his "neighbor B. commenced the day before."

Birds.

Many and various are the methods resorted to by the farmers to drive off the birds that occasionally pull up a hill of corn. And this is not to be wondered at, when it is remembered that a prejudice, against these ebony-colored inhabitants of the air, has been instilled into their minds from the cradle. That famous book of poetry, the delight of every child, "Mother Goose's Melodies," declares that—

> "Then said the black-bird to the crow,
> Let us to the farmer's cornfield go,
> For ever since Adam and Eve were born
> It's been our trade to pull up corn."

A moment's consideration, however, ought to satisfy every observant agriculturist that he can well afford to give them a hill of corn occasionally; their's being, in fact, the cheapest labor he can employ, as he would readily ascertain could he open a regular account with his feathered friends, charging the corn they take and crediting all the cut-worms, grubs, and other injurious insects they destroy during the summer. It is, therefore, to say the least of it, in bad taste for any one to disfigure his field with a "scare-crow,"

> "And let it keep one shape, till custom make it,
> Their perch, and not their terror."

It would be wise policy in our Legislators, and highly beneficial to agriculture, (but for that reason not to be hoped for,) if they would adopt some stringent enactments to protect the "lives, fortunes," and domestic happiness of these little, but useful friends of the farmer—the birds. Were it not for them, insects would, in a few years, multiply to such an extent as to destroy all the crops of the country. But this is too extensive a subject to be entered upon here.

Mode of Applying Plaster of Paris.

In planting corn, my habit has been to drop about half the plaster, (mixed with ashes,) designed for the crop, in the hill with the corn, and sowing the remainder, broadcast, about the time of the last plowing. I have, however, sometimes dropped it all in the hill at the time of planting; and again, I have sowed it all broadcast. The corn seems to do equally well under these various methods, the time and mode of applying plaster appearing to be of but little consequence. Every one, therefore, may choose the mode of application most convenient to himself.

Working the Crop.

The process of working corn ought to commence as soon as it is up enough plainly to distinguish the rows, for,

"Now 'tis the spring, and weeds are shallow rooted,
Suffer them now, and they'll o'er grow the garden,
And choke the herbs for want of husbandry."

This maxim is as correct when applied to the field as to the "garden."

It is well as a first operation to go over the field with a common triangular harrow, removing the front and rear teeth so as not to disturb the corn. After this I use double-shovel plows, going twice to the row, and following them immediately with a cultivator, which requires one of the latter to two of the former, the object being to leave the surface as level as possible, thereby diminishing the amount of evaporation and counteracting the tendency to wash and gully. The cultivator also eradicates any weeds or grass that may have escaped the plows. For the object above described, a five-toothed cultivator is better than the three-toothed implement, known under that name, and generally used in this county.

Whilst the primary and most important object of working corn is to destroy the grass and weeds that would otherwise spring up to the injury of the crop, there are other effects resulting from it not to be overlooked. The frequent stirring of the soil prevents the formation of a crust upon the surface, and keeps it always permeable to the dews and atmospheric moisture, the consequence of which is that a field kept loose and in fine tilth, by frequent plowing, will sustain much less injury from drought than one left undisturbed by the plow. I have, therefore, no prescribed number of times for going over my corn, but give it as many workings as the state of the weather and my other farming operations will allow.—Corn requires, as it can receive, more work in a dry than in a wet season. In working corn I avoid, as far as possible, injuring the roots; I therefore never plow it deep.—If it has been planted upon clover or sod-land, deep-stirring, either with a Coulter or other implement, will not be necessary to loosen the soil, as the vegetable matter turned under will prevent its becoming compact and hard. The truth is, upon such land, deep plowing would do injury, by bringing to the surface the sod, that ought, as it rots, to furnish food to the growing crop. If corn should ever be plowed deep it ought to be done at the first working, as then the roots are small and escape injury.

It being an important matter in this hilly country, to prevent injury to the lands by washing rains, that object is promoted by observing the precaution, always to commence plowing corn at the highest part of the field. If the operation is begun at the lowest part, and a heavy fall of rain takes place before the entire field is finished, the higher and unplowed part absorbs but little of the water that falls upon it, consequently a large amount is precipitated upon the lower and freshly-stirred land, inevitably producing incipient gullies, to be deepened by every succeeding shower. But if the upper part be first plowed, the absorbent capacity of the soil is thereby much increased, less water flows off, and as it passes over the unplowed and comparatively firm land below, does but little damage to it.

I have already said that in the tillage of corn I avoid as much as possible breaking and lacerating the roots; I therefore never plow corn after harvest, because having necessarily remained a considerable time without working, and the roots having spread themselves over the entire row and approached near the surface, a plowing then must inevitably break them to a great extent, the evils of which may, however, in some degree be repaired by a rain following immediately; but it is hazardous to run such risks, as dry weather rather than rain, may be looked for at that season.

It is important to go over the corn at least once with the hoe—and especially is this the case if the corn is drilled—as by this means the grass and weeds growing near the hill can be more effectually removed.

Gathering the Crop.

There exists a great diversity of opinion as well as practice in reference to the best method of harvesting this valuable crop. A description of the different modes pursued, with a notice of their respective advantages and disadvantages, even if I were competent to the task, would swell this paper to an unreasonable length, I shall therefore confine myself to a brief account of the method usually adopted in this section of the State; which although attended with some inconveniences, yet has the advantage of combining with the entire security of the crop an economy of labor attainable by no other mode. I refer to the plan that is technically called, "cutting up" the corn — that is, severing the stalk, with blade, ear, and top adhering—near the ground, and setting it in shocks of convenient size. This operation ought to commence as soon as the corn has attained a sufficient maturity not to be injured by it; but it is a difficult matter accurately to describe this condition.—Some say corn may be "cut up" safely when it has reached the "dough state;" I, prefer, however, to wait until it has just passed out of that state.

If the weather is moist and warm it is a safe precaution to cut but half the corn at first; this is done by cutting it in alternate strips of seven or eight rows—which gives to the corn first cut and set up an opportunity of drying before the shocks are completed by the addition of the remaining portion. The size of the shocks varies with the taste and judgment of the farmer—some persons making them as much as sixteen hills each way. Where the corn is drilled, if the shocks are set twenty-five feet apart, fourteen rows will make them large enough to stand up well, but not too large to dry thoroughly. When the shocks are completed, they ought to be bound tightly around the top with a band made of rye-straw, a white-oak split, or a wisp of fox-tail.

Corn, when well shocked, may be left standing all winter in the field without material injury—but this is not recommended. As the corn is shucked, the fodder is tied in bundles with bands either of rye-straw, or white-oak splits, an l set up where the shock of corn stood; and if it is again bound around the top it will keep better than by stacking—it being very difficult to stack such fodder securely. It can then be hauled from the field during the winter as it is required for the stock; observing the precaution, when the ground is dry or hard-frozen, to haul it from the centre and remoter parts of the field; that which is near the borders can be used in soft weather, when the land would be injured by going over it with a wagon and team.

This method has the advantage of securing both grain and fodder at one and the same operation, and requires but little, if any more time, than would be necessary to secure the tops alone; for the same number of hands will "cut up" a field of corn as soon as they would "top" it.

Experiments have been frequently instituted to ascertain what injury, if any, was sustained by "cutting up" corn as compared with topping and blading, and with that left to ripen on the stalk without taking off the fodder at all. The result of such experiments will always vary with the state of maturity of the corn. If corn is cut up before it has passed beyond the "dough state," I presume there can be but little doubt, that it will loose somewhat in weight as compared with corn that has been allowed to ripen on the stalk without taking off the fodder at all; and that this loss will increase in proportion to the immature condition of the crop. If the corn, however, has reached the "dough state," the injury it will sustain, by being cut up, will be so slight, that it will be more than compensated for in the other advantages of this mode of harvesting.

On the tenth day of September last I had a piece of corn cut up and shocked in the usual way; it had just passed beyond the "dough state," but was not hard, the fodder being still green. At the same time a small parcel in the same enclosure, and growing upon the same kind of land, was left to ripen on the stalk, without topping or blading. On the 22nd of October I had a bushel of each shelled and weighed: the weights were exactly the same.

Selection of Seed.

The importance of selecting seed corn in the field has often been urged upon the farmer in the most emphatic and earnest manner. But unless his object is to obtain his seed from stalks producing two or more ears, with a view to perpetuating that habit in his corn, I see no advantage to be derived from that method. I think it extremely apocryphal, whether any advantage whatever is obtained from planting those varieties of corn that produce two or more ears to the stalk. As a general rule they are late in maturing, and require to be planted with wide spaces between the hills, or the ears will be small and imperfect. It is a fact well known to all corn raisers that a good yield can only be secured by having a large number of sound ears to the acre, and that result is more easily and surely obtained by planting a single eared variety that will bear, crowding a large number of stalks upon a given area, than by trusting to any of those prolific kinds, "each, several, and particular" stalk of which is to produce a whole litter of ears.

Controlled by these considerations, I select my seed corn in the crib. I do not wait until planting time to do it, but select it, during the winter, as opportunity offers. In selecting seed corn I choose those ears that have matured well, as indicated by the grains being firm, close and compact upon the cob. Great care ought always to be used to obtain seed as pure and unmixed as possible. The different varieties of Indian corn mingle so readily, that unless much attention is paid to this particular, the farmer will soon find his crop of such a heterogeneous description, that the lines of the "witches song" might well be applied to it with but slight variation:

> "Black grains and white, red grains and gray,
> Mingle, mingle, you that mingle, may."

WM. M. TATE.

Augusta County, Oct. 24th, 1858.

For the Southern Planter.

Tobacco the Bane of Virginia Husbandry.

No. 3.

MR. EDITOR:

My last gave a detail of the troubles of this most troublesome of all crops, up to the process of stripping—and at this stage the account is resumed. The operation consists of taking the cured tobacco from the bulks, and stripping the leaves and ruffles from the stalks; and is performed by the best judges among the hands—who, at the same time, assort the leaves, as to size, color, and quality, according to the imaginary standard which may happen to prevail as the fashion of the times—which constantly changes like other fashions: these assorted leaves are passed into other hands, who open and examine the surface on each side, and brushing both, are then tied in bundles of five or six; this is the last surface examination of the leaf, and upon an average of years, will be found to comprehend some ten or a dozen times at least, that every superficial inch, of every tobacco leaf of a well tended crop, must pass under the manipulation or visual examination of the operatives in making and preparing it for prizing. And here may be noticed two other troubles, omitted in the foregoing numbers, more or less incident to every tobacco crop—the ground worms and the ground suckers. The tobacco worm proper, or horned worm, attacks the leaves of the plant, when grown to some size; but there is a smaller, dark, earth-colored worm, which seems to be the natural production of the highly prepared soil—loose, friable, and kept entirely clear of all living vegetable matter—which enables this earth-worm to move beneath the surface, and by an instinct of its nature is attracted (sometimes in considerable numbers,) to the top of each tobacco hill, and cuts off the young plant, just below the surface. These ruthless destroyers must be narrowly watched, so long as the stalks have not grown hard enough to resist them. No inconsiderable trouble this, as every tobacco maker well knows.

The ground-suckers spring up from the stalk below the ground, after the successive crops of suckers from the foot stalks of the leaves have been exterminated, which usually takes place some time before the plant is ready for the knife, and leaves some length of time for the ground-suckers to give trouble, as they continue to spring up until the crop is taken off. Thus it is made manifest how the tobacco crop starves all others, by demanding the largest share of labor, and all the manure—monopolizing both to such a degree by universal custom, as to spare but a stinted allowance for the garden, and a restricted patch of early Irish potatoes.

It is a well known common condition of tobacco plantations, after using up a quarter or half acre of cow-pen turnip patch,* to be utterly destitute of any succulent vegetable, or greens to boil with the bacon, for many weeks in the spring, until the advancing season for "wild sallet" comes in for the relief of the sufferers under the tobacco starvation, with poke, pepper-grass, and dandelion, kindly provided by Divine Providence, in the prolific soil of Virginia.

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* The cow-pen for turnips is often seen most wastefully covered with cow dung, because the time can't be taken from the tobacco to move the pen.

But this starvation of man is small in comparison of that which tobacco inflicts upon the domestic animals. A full crop of tobacco, as a general rule, causes a short crop of corn—and scarcity of corn upon a Virginia plantation is synonymous to hard-times. The tobacco crop affording no provender for domestic animals, reduces the stock of a plantation to the scanty offal of a scanty corn-crop.

Tobacco and grass crops may be pronounced irreconvertable antagonists, and hence Virginia is so large a customer in the market for Northern hay: A state of things wholly chargeable upon tobacco—for it may be safely asserted that if one fourth part of the labour and manure now bestowed upon tobacco was used for the production of grass, we might be larger exporters of a superior article, than we are now importers of Northern hay. But man is so much the creature of habit, that tobacco makers are content to regard starved cattle as the natural state of things in the spring, and with a good store of dollars in the desk—to put up with stinted household comforts to the degree of taking his coffee without milk for many weeks in the winter—the cows having all gone dry by Christmas—and no wonder, when they have had no hay provided for them, and have been living since the natural grasses were killed by frost, upon the chaff and dry straw which happened to be on hand. The corn stalks are soon picked—and few or no shucks can be spared from the steers, (working oxen,) it being the experience of the country, that no other long forage, the product of a tobacco plantation, is nutritious enough to sustain oxen at work. Shucks, aided by nubbins, must therefore be relied upon for keeping up this part of the working stock of the plantation. But the nubbins (the inferior corn) is the customary and only resource for feeding the sows and pigs, and which, from a tobacco-starved corn crop, always turns out to be a most scanty and insufficient allowance; rarely, if ever sufficient to raise pork enough to keep the tobacco maker out of the pork market—and here is another standing count against tobacco for starving the smoke-house.

But as has been already alleged, tobacco starves the corn-crib, even to the degree, that demands a large portion of the proceeds of the tobacco crop to buy the corn necessary to support the plantation. A large proportion of the middle and lower class of tobacco makers are corn buyers.*

But this is not all: The tobacco planter, for the want of corn, has not only to buy meat and bread, but for the want of grass to raise them, has also to buy his mules and work horses, virtually being made a tributary by his tobacco, for a primary necessity in his calling, to the western drovers.

Tobacco exhausts the land beyond all other crops. As proof of this, every homestead, from the Atlantic border of the State to the head of Tide-water, and several tiers of counties above, have been, until lately, a mournful monument. This portion of the State once produced all the tobacco made in Virginia, but is now so reduced and impoverished, that, for many years past, it has not produced a hogshead for market. Tobacco has been literally the besom of destruction, which has swept over this once fertile region, and reduced it to a state too poor to remunerate labor employed in its production. And yet those who are still engaged in its culture argue that tobacco is not as great an exhauster as Indian corn, in the face of the fact, that the inhabitants of the tobacco-ruined region still make living crops of corn; and since the abandonment of tobacco and the introduction of marle, (which they never found time to look for, or apply, while their heads were full of tobacco,) are now improving their lands more rapidly than the tobacco makers, with all the late improvements of agricultural science to aid them upon the still unexhausted region of the State.† It is hard to conceive of a more exhausting process than the exposure of naked, fresh-worked land to the powerful influence of our summer's sun; this is an indispensable part of the tobacco culture—from early spring, through the two first months of summer—the tobacco land is plowed, replowed, harrowed and hilled, or, after hilling, kept carefully weeded until planted—and it is rarely the case that the crop is planted early enough

* Examples are known of planters who buy corn to a greater amount than the proceeds of their tobacco crops.

† It is admitted that tobacco makers, by the means of the improvements in modern culture, and the introduction of guano, may *positively* improve their estates, but it is confidently asserted, that they must comparatively do less in the way of improvement than they may under the abandonment of the culture.

to cover the ground so as to shield it in any considerable degree against the sun before August.

But the argument most relied upon for tobacco is, that it is the best preparation for wheat. Admitted it is as good as any, it is not better than fallows, acre for acre, and incidentally worse, for the following reasons, viz: the high manuring required for tobacco, limits the improvement to a smaller surface, and the tobacco exhausts more of the virtue of the manure than any other crop; nevertheless, being of a different nature from wheat, it leaves the peculiar pabulum of small grain in ample sufficiency, and so thoroughly incorporated with the soil, by the elaborate process of preparation and tending the tobacco crop, as to give successful results in the following wheat crop. But when compared in the more limited surface, by reason of the excessive high manuring required by tobacco with the wider space which the farmer may put into the highest preparation for wheat, the tobacco system may safely be denied to be the best preparation for wheat. With the present improved system of skilful fallowing, double the amount of surface can be put into tilth, sufficient to produce thirty-five or forty bushels per acre, which, with the other advantages of the farming system, would soon leave the tobacco plantation far in the rear in point of profit; thus the argument drawn from the assumed fact, that tobacco is the best preparation for wheat, is fallacious.

That tobacco is the most exhausting of all crops is demonstrated by the impoverishment it has brought upon all the counties of Virginia, as already adverted to, from the sea to the mountains, to such a degree, as that its cultivation has been abandoned; and the swift destruction it is every where bringing upon the remaining virgin soils, where it is still cultivated—for it is a well known fact that the richest high lands are rarely found strong enough to bear a third crop in succession, but becomes so much reduced by the second crop usually, as to be put into wheat, to be followed the next year by corn, then again in wheat or oats—after which it is "turned out," to be added to our wide domain of "old field."

After being "turned out," it is known to be incapable of ever producing another crop of tobacco, without being manured or improved by clover rotation and plaster, and of late by guano. But, whatever may be the effects of this new improver, it cannot divest tobacco of its inherent disastrous starving influences upon all other crops, as already described; and consequently, of its fatal effects upon the rural economy of the country, according to the greater or less extent to which it prevails, and which fixes upon it, most undeniably, the character of the Bane of Virginia Husbandry. These views are addressed to the agricultural public of Virginia, as seeming to the writer to rest upon the well known principles of rural economy. A future number may be employed in examining tho arguments by which the tobacco culture is defended; and before the branch of the subject of this number is dismissed, one further argument only will be presented, and perhaps the strongest of all—the argument from authority—the example and experience of Richard Sampson, Esq., of Little Dover, well known as the most successful agriculturist in Virginia. Mr. S., after a fair experiment of ten years, gave up the crop, and gives in a nut shell one of the best aphorisms of his strong, practical mind upon the subject—showing the reasons why he abandoned the ruinous culture. He says "he could not afford to cultivate tobacco, finding it took one half of the labor of the plantation, and yielded but one fourth of the value of the other products."

With such a witness against tobacco, in aid of the arguments adduced, I can here well afford to conclude my 3rd number.

JOHN H. COCKE.

For the Southern Planter.

The Guano Controversy, or Vegetable Physiology.

MR. EDITOR,—Over the name, W. A. Bradford, in the March number of the Planter, appears a rejoinder to a critique by B., in the January No., which B. regards as claiming some notice. The controversy seems narrowed down to the simple question whether vegetables have an organized system of nerves? Unless this be, in some way, established, the gentleman will not admit their susceptibility of being acted upon by *mere* stimulants. B. has asserted that vegetables are susceptible of the action of stimulants, and infers therefore that there must exist "a mode of action." Mark! B. has not asserted that there exists "an organized nervous system," but such susceptibilities as sustain to the vegetable a relation similar to that of a nervous system to animals. Sensation, excitability, contractility, &c., are usually referred to the agency of nerves; but if we allow them to exist no where, except where an organized system of nerves can be shown to exist, then they must be denied to some animals. Who has ever exhibited the organized apparatus of the oyster, the worm, the zoophite? If no one, then the gentleman must deny their susceptibility to the action of stimulants. The truth is, that there are many things in nature, particularly in the animal and vegetable kingdoms, the existence of which can only be inferred from their effects—their visible phenomena. The gentleman concludes, however, that if B. "will prove that they (vegetables) are capable of being thus acted on," (that is by mere stimulants,) "I (he) will admit the existence of such a system pervading their organization." Now this seems very fair, but will the gentleman be satisfied with reasonable proof, of what B. asserts? B. thinks he has already furnished what should be convincing proof, and fears that none he can offer will induce conviction. Seeing the gentleman has so intertwined and bound up the idea of stimulation with the existence of "an organized nervous system," it may well be regarded a difficult task to untie the knot and unwind the ball. B. had supposed that "exalting and quickening the vital forces or actions" were phenomena of the action of *stimulants;* and consequently that whatever agents exert such influence, may be rightfully denominated *stimulants,* though not necessarily "*mere* stimulants." The gentleman will scarcely deny, that when "the vital forces or actions" of plants "are exalted and quickened," that the circulation of nutritious juices in the plant are at the same time accelerated. Here then, at least, we have one of the phenomena of the action of a mere stimulant. Stimulants acting upon the nervous system of animals, (the higher order at least,) "exalt and quicken the vital forces or actions" and accelerate the circulation of the nutritious fluids. A similar result, from the action of a like agent, argues the existence of similar susceptibilities of action or impression. Such would be the action of alcoholic liquors, and they approximate as near to a *mere* stimulant as any other and probably more so. Says the gentleman, "brandy, musk, opium, camphor, *et id omne genus;* mere stimulants—agents that are powerful when applied to a system of nerves, but innoxious when applied to plants." *Innoxious* to *plants*! How comes the gentleman to know this? By innoxious he is supposed to mean, innocent, producing no ill effects. B. thinks if the gentleman will pour strong brandy or alcohol on any delicate and tender plant, he will find that he is mistaken. Again, how does the gentleman know that "all the positive phenomena of such action (stimulant) are found in connection with such a known system" (of nerves?) And farther, B. might ask the gentleman, what he means by the "positive phenomena?" What B. regards as positive phenomena of stimulation, or the action of stimulants, abound as well in the vegetable as animal kingdom. The Creator has so ordained, that what is food for one, is, for the most part, poison to the other. So what may be a stimulant to one, may prove a sedative to the other. Animals cease to breathe in an atmosphere purely carbonic, while plants luxuriate in it—inhale and appropriate it as food for their sustentation and growth. Animals inspire and appropriate oxygen and exhale carbon, plants directly the opposite. Animals elaborate food for plants and plants for animals. Thus the two kingdoms, animal and vegetable, mutually sustain each other with appropriate food. But, says the gentleman, "it is one thing to increase the functions of organic life, and another to stimulate an action that is unattended with nutrition, growth or development." B. can conceive of no such stimulating agent—one which when applied to either animals or plants, shall furnish neither "nutrition, growth nor development." Brandy is an acknowledged stimulant, and the gentleman has set it down as a *mere stimulant.* This certainly causes most unmistakable development, and if in no way nutritious or promotive of growth, how comes it to pass, that those who use it freely, to a certain extent, are so much disposed to obesity and grow often to enormous size, and again laying aside its use, shrink back to original dimensions? Now, brandy and alcohol, as already intimated, are as nearly *mere* stimulants as any agents known, and if their operations so far transcend the action of the gentleman's "*mere stimulants,*" it is needless to offer another example. B. still asserts that plants are susceptible of having their "vital forces or actions" exalted and quickened "as well as nourished," and that some manures exert this influence much more actively than others. Farther, B. claims that he has as much right to require the gentleman to prove the non-existence of the "organic system of nerves," as the gentleman has to require him (B.) to prove its existence; seeing that B. has not asserted such existence. He has asserted that vegetables possess certain susceptibilities, which he thinks abundantly appears. Plants have a circulation. Can the arteries, veins, lymphatics and the centre of circulation—the heart—be exhibited? We say the leaves perform an office similar to respiration in animals, and we believe it; but who has seen them dilate, drinking in plentiful draughts of carbon and again contract, exhaling pure oxygen? Yet some action, answering to these ends, must exist, or the result could not be had.

Says a distinguished and learned physiologist, in vegetables, "two properties direct the action of their small number of functions: a latent and faint sensibility, in virtue of which, each vessel, every part of the plant, is affected in its own way by the fluids with which it is in contact: a contractility, as little apparent, though the results prove irrefragably its existence; a contractility, in virtue of which, the vessels sensible to the impression of liquids, close or dilate themselves, to effect their transmission or elaboration. The organs allotted to reproduction, animate, for a moment this exhibition: more sensible, more irritable, they are visibly in action: the stamina or male organs, bow themselves over the female organ, the pistil shakes on the stigma the fertilizing dust, then straighten, retire from it, and die with the flower, which is succeeded by the seed or fruit."

B. has not endowed either the sunflower, or the sensitive plant, with "such a piece of exquisite machinery, as a nervous system:" nor does he regard "such exquisite machinery" necessary in order to the exhibition of the phenomena he claims, very different "machinery" may, by the Creator, whose "ways are past finding out," be made to answer similar ends. This will manifestly appear to any one, who will take the trouble to examine minutely the anatomy of animal structure from man down to the lowest order of animal existence. Familiar, as the gentleman seems to be, with the nervous system of animals, he will find it no easy task to explain, intelligibly his "positive phenomena,"—when he shall have done this, then will B. feel under obligation to attempt a farther elucidation of the mystery involved in the action of agents upon the vital susceptibilities of plants.

Farther, says the gentleman, "I am compelled to seek my causes for such phenomena, in some of the greater forces of nature, &c. None of these are of more potency than heat, and as the sun is the greatest of all natural sources of heat, why may it not be able to produce these insignificant effects, upon the sun flower and the so called sensitive plant, &c." Heat is confessedly a potent agent—and unquestionably "exalts and quickens the vital forces or actions" and is so far at least, a stimulant. But how does this potent force act? certainly not alike in the vegetable and animal kingdom as in the mineral. All the *sublime phenomena* of "upheaving and overthrowing mountains—melting down mountains and causing them to flow like rivers—dissipating rivers into thin air, and bearing them on the wings of the wind"—and such like sublime effects are ascribable either directly or indirectly, to its power of expansion. But in its action upon animals and plants there is little need of this power. The potency here excited, is an "exalting, quickening," life-giving energy; a something without which life cannot exist. It is true that some vegetables as well as some animals, are so constituted as to exist in much lower temperatures than others—yet a certain degree of heat is indispensable to the existence of all, and again, a certain increased temperature is fatal to all.

Seeing how ruthlessly the gentleman has "stripped his little Divinities of their God-like attributes," B. may be regarded as not in the best *humor* to appreciate his *elevated* association with Virgil and Thomson. Apropos, how sensible were they to the influence of the seasons; the genial, the awakening, *stimulating*, influence of the one and the depressing and saddening influence of another. B. claims no poetic aspirations, yet confesses himself cheered by the bright sun, after a sombre and cloudy day, and exhilarated by the genial warmth of the "vernal sun" after a cold and dreary winter. Indeed, all animal and vegetable natures seem to greet spring as with smiles.

In conclusion, B. asks the gentleman, to be assured that he is not insensible to his (the gentleman's) pleasant and courteous manner, nor to his *complimentary* farewell, yet his *modesty* forbids a change of signature. The autograph he shall have. Possibly some day the gentlemen may meet and consummate, with much satisfation, an acquaintance thus pleasantly initiated. B.

For the Southern Planter.

Effects of Sub-soil Plowing.

Mr. Editor:

Having read in the March number of the Southern Planter an article by Mr. Hite, in which he says, "How much satisfaction would be given if every farmer in Virginia, who has sub-soiled his lands, would state how many years he had used a sub-soil plow, and also whether or not he had found wheat and clover to withstand the frost of winter better where the land had been sub-soiled a year or two previous," I feel called upon to contribute, as far as I can, to the gratification of the interest which all farmers entertain—in a greater or less degree—upon every subject pertaining to agriculture, although I am but a novice in farming, and almost afraid to communicate my limited experience to the public. In the fall of 1857, I broke up a field belonging to my mother, of about twenty-five acres, which had been for a number of years (say ten or twelve) in timothy. I used two three-horse McCormick plows, with cast mould-boards and points, with teams of three strong horses to each; a two-horse common coulter following in the track of one of them, thus sub-soiling every alternate furrow. The sod was turned to the depth of nine or ten inches, and the sub-soil of the coultered furrows was loosened seven or eight inches more. I measured on the upper and lower sides of the field, when I ascertained that I had plowed and coultered an average depth of fourteen or fifteen inches. I regretted much after my crop had been made that I had not used the coulter after both plows. It was in the months of November and December that I plowed the field, turning the sod beautifully, and as early in the following spring as the weather would admit, I introduced the harrow, putting the land in fine condition with but little trouble, it having already been mellowed by the winter's frost.

I commenced planting corn on the 9th of April, and had planted from six to ten acres when a rain occurred, which stopped the operation. It snowed and turned cold at night, and remained cold and freezing for several days. I thought of course my day's labour, as well as the corn I had planted, was lost, but much to my surprise and gratification, I found in due time that it came up finely and grew well during the season. My next planting was commenced about the last of April. I used the remainder of the corn left from the first planting, which had been rolled in plaster and ashes and carefully kept in a dry cellar, not one hill in fifty of which came up, having sprouted and died before planting. I then had to plow and lay off the land again, and re-plant it, which of course delayed the completion of the work till very late in the season. I knew the land was fine and that the preparation had been good, and therefore had faith in the final result. The last planting came up beautifully, and in a short time you could see no difference in the field, all being uniform. As soon as the corn was high enough, I took my harrows, having removed the front and one back tooth, and harrowed it all nicely, killing out all the young grass. I then introduced cultivators, with seven or eight teeth about four inches wide, the ground being in such perfect order they worked elegantly, and left the land as clean as it well could be. As soon afterwards as I discovered the young grass shooting up, I started my cultivators again, followed by the hoes, and thinned, leaving two stalks to the hill, which left the land again perfectly clean. I worked it next with double shovel plows, which finished the working of that field. I dropped plaster and ashes on the hill when about a foot or more high.

I never saw a more beautiful field of corn. As it was on the public road, every body that passed was struck with its fine appearance. One gentleman observing the great height of the corn and its luxuriant growth, was induced to take a stalk of it to Lexington for exhibition. The stalk, root included to the top of tassel, measured eighteen feet, and had on it two perfect ears of corn.

The land is mulatto soil with a clay subsoil. I cut the corn up and shocked it in the field, and I think I can say with safety the field averaged sixty bushels per acre, some farmers thinking it would make seventy-five. It so happened I could not measure the corn. After the corn was shocked, I started my harrows to level the grass and weeds which had grown since the last plowing of the corn; after which I seeded the field in Zimmerman wheat, (red) at the rate of about two bushels of seed to the acre, and covered it with double shovel plows. I never saw a more beautiful field of wheat in my life than it was last summer, and had it not have been for the rust, the great enemy of the wheat crop, I would have made at least thirty-three bushels to the acre. But, alas! man's calculations are vain; the destroyer came, and my crop was ruined. I made of tolerably fair wheat for last year not more than one-third of a crop, weighing about sixty pounds per bushel,—the general weight in good seasons being about sixty-four or sixty-five pounds per bushel.

Judge Brockenbrough has put the same field in wheat this year, (white blue stem or purple straw.) It looks very fine indeed at this time, (March 17th,) is well matted over the field, and very luxuriant.

I am glad to see that so much more interest is taken in farming in our county than formerly. Some of our most successful farmers and men of wealth are introducing all kinds of improved farming implements, such as McCormick's reapers, wheat-drills, lime-spreaders, &c. The county is brushing up, and every farm is improving.

Fearing my communication is already too long, I will conclude by saying I have had no opportunity of judging of the stand of clover after the sub-soiling, as the judge has only seeded the field this spring with clover and timothy.

If you consider this worthy of a place in the Planter, you can publish it.

Very respectfully,

JAS. H. BOWYER.

From the Scientific American.

Asphalt—Composition Roofing.

It is very desirable that many buildings should be constructed with flat roofs, for which common shingles are inapplicable, and tin too expensive. A composition for such a purpose, perfectly waterproof, easily applied, cheap, and durable in its nature, would be of great benefit. Quite a number of compounds have been tried for this purpose, some of which have failed to secure the desired ends, while others have been highly successful. A roofing compound of asphalt, coal tar, and sand has lasted for ten years on certain roofs, and is still as good as when first put on, while the same materials laid upon other roofs had to be removed within one year after being laid, on account of cracks in the cement. Such success on the one hand and failure on the other with the same identical substances has occurred in every section of the country. As this composition roofing is about the cheapest known, it is highly important to discover what can be the cause of its want of success in any case, as it is very evident that if successful in one instance, it can be made so in all cases. It has been found by experience with such composition roofs, if laid upon a moist bed, or if the cement itself contains moisture or volatile oil, they are liable to crack and scale off. One or both of these causes, perhaps, contributed to the failure of the roofs alluded to.

To make such roofing, two or three layers of thick tar-paper should first be tacked down upon the boards, then brushed over with a thick coat of hot pitch, so as to render the surface smooth and expel all the air, to prevent air bubbles forming in the cement. When the pitch is perfectly dry, the asphalt composition is to be put on. This consists of 15 lbs. pitch, 25 lbs. asphalt, and 30 lbs. dry sand. The pitch is first melted, then the asphalt, as finely comminuted as possible, is added. This amount will answer for ten square feet in two layers; it should be boiled for two hours, and kept stirred during the operation, to expel all the volatile oil. When thus prepared, it is carried in buckets to the roof of the building, and poured carefully upon it in sections, set off with boards set on edge. Care must be exercised not to permit any of the sulphates of iron or sulphur to be mixed with it. A thin layer of tow or hair laid upon the pitch before the cement is poured on will render the roofing more elastic. Previous to its becoming dry, a layer of marble dust or ground chalk should be beaten into it, and on the top of this a layer of fine white sand and gravel. The object of this is to prevent the rays of the sun penetrating into the asphalt to soften it. Two layers of this composition should always be laid on—the top one after the other has become dry.

Common pitch will answer the same purpose as natural asphalt, if two pounds of coal tar is mixed with every twenty pounds of dry sand. Such roofing can be very easily repaired if it cracks, but if sufficient care is bestowed in preparing and laying down the materials, no such repairs will be required for several years.

From the Ohio Cultivator.

Handling Horses while being Shod.

Many horses, both young and old, are much spoiled by shoers. Horses sometimes stand quiet and easy, at other times they refuse to stand still while one foot is up—they struggle until it is released, and frequently the shoer beats, speaks sharply, swears, and frightens the horse, so that he must be held by force or abandoned. Another takes the tools and sets his shoes without any trouble. Now for a few of the reasons:

Under certain circumstances, the muscles cramp, causing severe pain. Almost at any time a horse's hind leg may be raised so high, or in such a position, as to cause severe cramping, not to be endured. When a horse has had all the muscles relaxed by exercise, and stands and cools quick, an unusual position will most certainly produce cramping, and at the same time makes him irritable. A horse that has stood for some time in the cold, uneasy, and suffering with anxiety to get home, is in bad condition to stand the bangs and often painful position of shoeing, and too often fretted to that degree that he never gets over it—too often forced to stand and endure the pain of severe cramping, pricking, etc., until he will never forget it, and often refuses to enter the shop again.

Some horse shoers have a habit of raising the foot and leg so high that no common horse can stand it, and thus he will shoe horses half his lifetime before he knows the fault is in himself. The awkwardness and ill temper of some shoers is sufficient reason to withdraw your patronage, although they may do their work well. The damage done by forcing the horse to stand in pain, and the injury to his disposition, is infinitely more injury than to go ten miles, and spend a day and pay double price to one who has some sympathy, and shoes him without pain—one who exercises some reason and judgment and patience, and seems to sympathise with the suffering animal—has little or no trouble, and does no damage.

I once knew a horse that if he was minus a shoe, would go by himself to a particular smithey, and there stand until the shoe was set. I once owned a horse that was shod three or four years without any trouble—at last he was sent to a shop to be shod, the shoer being a little intoxicated, frightened him, beat and abused him in such a manner, that he ever after feared to approach a blacksmith shop, and if forced to enter one, would tremble with fear. I think I shall be justified in saying that one-half of the horse shoers are incompetent to the task, saying nothing about their workmanship of setting shoes. I have no doubt but some fancy shoers are the cause of many splints, bogs, and curbs, as well as kicking, cringing, pulling at the halter, etc , etc.

Reader, if you are the owner of a good horse, go yourself and see him shod, unless you are well acquainted with the shoer, and know him to be careful, patient, mild-tempered, and humane. Withdraw your patronage from all reverse characters, before you sustain a loss. Never submit to or employ a shoer, whose character or intellect is inferior to that of your horse. If you do, you may have him lamed, abused and spoiled.

W. Pierce, V. S.

Ravenna, Feb., 1859.

Fast Horses Agriculturally Considered.

In all our horse talk and writing, we have spoken disparingly of that class of horses, the only merit of which is, that they are merely fast. These gaunt, leggy spiders, that can do nothing but run, are about as useless in this world as those fancy gentlemen in flashy vests, who generally attend them in their airings. And we have still less sympathy with the gamblings attendant upon the meetings of this class of men and horses upon the turf. We have never attended such a meeting, and have no desire to. Thus much for our disclaimer.

Of late, quite a respectable portion of the agricultural press, and many of the news and literary papers have come down upon the "trials of speed" at agricultural fairs, which they say is only horse-racing, under another name. Well, it is hard to say just where we pass the line of healthful rivalry, when once we enter the path of competition. Mrs. Smith and Mrs. Jones both compete for the prize for the best ten pounds of butter. Mrs. Jones does her best, but Mrs. Smith does a little better, by her superior dexterity with the skimmer or the ladle, and she wins. Here is a woman race, with all of its rivalries and expectations and disappointments, on a small scale. Almost every body says it is right; we shall not dispute with them. Clark has a Suffolk pig—he believes in Suffolks. White has a Byfield—he believes in Byfields. Clark and White set out to see which will make the best porker in a given time. One tries the jugglery of ground and cooked feed, the other the mystery of steamed potatoes and corn in the ear. One beats, of course, and the other thinks he cheated. Here is a hog race.—Judge B. and General C., being troubled with plethoric purses and ambitious brains, go to England or Timbuctoo, and each buys another calf, which is educated and brought up far more carefully than those who call them father, and at a proper time exhibited for the big prize. Here is a bull race, a step or two in advance of the others.

Charley has a nice filley, with thin, sloping shoulders, long hip, and such a good walker; he would like to see the nag that could out-walk his filly. Charley is riding into town, and Jim comes up on the same errand, and having learned the state of Charley's mind, accommodates him to a walk with his sorrel for a quarter of a mile: the stakes are the good opinion of each boy for his nag. Charley loses. Nobody ever thought that was a horse-race; well, may be it wasn't. At the county fair, John had a Morgan and Will had a Bellfounder; standing still, the judges could not tell which was best, and as one or the other had to be best, the judges said, "Let's see them move." John trotted, and Will trotted; John trotted faster, and Will trotted faster; John trotted as fast as he could, and Will trotted as fast as he could, and they both trotted as fast as they could, and kept on trotting; and the people gathered about, and each one of the five thousand made up his or her mind which horse they would rather have, and so did the judges, and the trotting was over. And then some folks thought they began to smell a horse race! and some folks have a nice and discriminating sense of smell.—Our olfactories are not that sharp.

But enough of this pleasantry. We are willing to take a more serious view of the subject. One objector says, "Fast horses are *not* an agricultural necessity, nor even an agricultural product. No practical farmer need be told that the rearing and training of such horses is at utter variance with agricultural success. Fast horse flesh has no practical value since the introduction of railroads and telegraphs." That is what a young gentleman wrote of the late exhibition of the United States Agricultural Society at Philadelphia.

It is an "agricultural necessity" to raise fifty bushels of wheat to the acre, and so get fifty dollars instead of fifteen dollars for your crop! Is a two thousand pound bullock an "agricultural product?" Let us abolish these railroads, so that the beeves we send to Gotham will get nice and tough, as in former years, by a four weeks' travel on foot, because these New Yorkers are getting better steaks than they deserve, and our cattle-feeders are getting too much money. Let us have a moral reform society, and petition the Legislature to pass an Act, forbidding any farmer to raise a colt that can trot faster than a mile in fifteen minutes, or that shall be worth over fifty dollars at four years old, because "fast horse-flesh has no practical value" now, and a five-hundred dollar colt is "an agricultural product."

Oh, George! It may do to talk that way in Sleepy Hollow, but the very Quakers of Ohio would laugh at you for telling such stuff out here. You should have seen friend Joseph put his Black Hawk around the ring at Cleveland, and friends William, and James, and Thomas, and John, and lots of others, among the fastest and most successful competitors. Do you say Ethan Allen is not an agricultural product? and our Champion Black Hawk? Flying Cloud?—Highlander? Monarch? Hassan? Kennebec? You never sat in the buggy with Reber of Lancaster, after his black mare, or with Brown of Trumbull, after his gray, or rode through the oak openings of the Darby with Fullington beside his Morgan stallion, chasing cattle. Take a seat with our farmer friend, Mordecai Lee, of Stark, after his Fly, and when the wind begins to whistle in your ears, ask Mordecai what he will take for the mare, and see how quietly he will tell you, she is not for sale; and after a little more such experience, learn some good hard horse sense, and confess that raising of such is *not* "at utter variance with agricultural success."

We can hardly bring our pen to write seriouly on this subject, after all. Life is but a race, of one kind or another, and the best advice we have to give is, not to run against each other's sulkeys, or leap ditches so wide that you will stick in the middle. Don't get out of breath. And don't fret. So we will come to the end of the race in good order.—*Ohio Cultivator.*

Mourning Customs.

A French writer gives a summary of the different observances among mankind, relative to mourning and funeral ceremonies, which we think will interest our readers. All the world, says he, are acquainted with the grandeur of the Roman obsequies and funeral games. The Greeks also burnt the corpses of distinguished men, with funeral feasts, and the lamentation of hired weepers, though they generally displayed a less sumptuous grief, and better regulated piety. The Persians buried the bodies of the dead; the Scythians ate them; the Indians enveloped them, for preservation's sake, in a sort of locker; the Egyptians embalmed and dried them, exhibited them on festal days, placed at the table among their guests guarded them as their most precious possessions, and loaned and borrowed money on these strange pledges. In our time, the custom of dancing at funerals is only practised in India and among some savage nations; but funeral entertainments still prevail in many European countries. Amongst others the ceremony of interment is solemn and silent, which nevertheless does not interfere with the wish that all may be forgotten as speedily as possible. We observe more ostentatious rites for persons of consequence. Their carriages follow them to the graves, and sometimes their horses are paraded, which having been made to fast seem to partake of the affliction of the occasion. The Orientals, from whom we borrow this custom went further—they made the horses in funeral processions weep, by blowing a particular kind of powder up their nostrils.

In Italy the mourning was formerly white for women, and brown for men. In China it is white; in Turkey, Syria, and Armenia it is blue; in Egypt, yellow; in Ethiopia, grey. Each of these colors had originally, its mystical signification. White is the emblem of purity; celestial blue indicates the space where the soul ranges after death; yellow, or the tinge of dead leaves, exhibits death as the end of all human hopes and man falling like the leaf of autumn; grey represents the color of the earth, our common mother; and black, the funeral costume now adopted throughout Europe and America, is an allusion to the eternal night.

In England, the sovereign never wears black; he is clothed in dark purple as mourning. Till the reign of Charles VIII, white was the funeral garb in France. The Emperor Leopold, who died in 1705, used to suffer his beard to grow in disorder during the whole period of mourning. In this he imitated the Jews. The dowager-empresses never left off weeds, and their apartments were hung with black till their death.

The Chancellor of France is the only person who never wears mourning. The brothers, nephews, and cousins of Popes never wear it; the happiness of having a Pope in the family is too great to allow them to be affected even by his death.

But the most remarkable of all these usages, is, perhaps, that of the people of those ancient nations, who dressed themselves as women when they lost their relatives, in order, it is said, that the ridicule attached to their vestments might make them ashamed of their grief.—*Scientific American.*

Cause of Frog Showers.

The actual fact that considerable spaces of ground have been suddenly covered with numerous small frogs, where there were no frogs before, has been proved beyond a doubt. Some have called in the aid of water-spouts, whirlwinds, and similar causes, to account for their elevation into the regions of air, and some have even thought that they were formed in the clouds, from whence they were precipitated. It has generally been in August, and often after a season of drouth, that these hordes of frogs have made their appearance, but, with Mrs. Siddons, we will exclaim, "How got they there?" Simply as follows:

The animals have been hatched, and quitted their tadpole state and their pond at the same time, days before they become visible to, or rather observed, by mortal eye. Finding it unpleasant in the hot, parched fields, and always running a great chance of being then and there dried up by the heat of the sun, they wisely retreated to the coolest and dampest places they could find, viz: under clods and stones, where, on account of their dusky color they escape notice. Down comes the rain, and out comes the frogs, pleased with the chance. Forthwith appears an article in the country papers; the good folks flock to see the phenomenon. There are frogs hopping about; the visitors remember the shower, and a simple countryman swears the frogs fell in the shower, and he saw them fall; frogs, visitors, countrymen, editors, are all pleased, and nobody undeceives them, nor are they willing to be undeceived.—*Buckland's Curiosity of Natural History.*

From the Ohio Cultivator.

Hot Beds—Progressive Management.

After your plants are fairly up, they will require considerable care to prevent their burning, especially if the sun should be hot. If you observe that they get very small at the bottom and lop over, you may conclude they are too hot, the remedy for which is, water them freely with cool water and allow them more air. If your plants turn yellow, they are too cold, and then warm water, if any, should be used, and they should be kept closer, especially in cold weather and at night. Be Careful to shut down your sash awhile before the sun goes down, so that it may generate some heat in your bed, as a preventive against the cold of night. Cold, cloudy weather is worst, as it is then difficult to keep the hot bed close enough, and at the same time allow the plants a sufficient supply of light, which is as necessary for their healthy growth as heat or moisture. We have had plants, when covered, and light only admitted at some places, lay flat down on the bed towards the light, thus showing beyond question the necessity of light to vegetation.

If you want a liberal supply of plants, make another bed, same as first, (only as the season grows later you will need less heat consequently less manure,) into which prick out your tomatoes, egg plants, peppers, etc., four inches apart every way; then, in your old bed, which by this time has lost considerable of its heating power, prick out your cabbage, cauliflower, and like plants, also about four inches apart each way, thus giving them all plenty of room to grow up stocky and firm. Remember that one good plant is worth a dozen poor ones, either for profit, or to cultivate merely for pleasure,—for we envy not that man his existence upon this goodly world of ours who takes no pleasure in beholding the growth of the vegetable kingdom, especially that part of it, which, with the development of every leaf, bids us hope for the plentiful harvest beyond.

About the middle of April, or as soon as the grass and oats begin to grow, remove your cabbage and like plants to their final place. Then take up every alternate row of your tomatoes, and set them into the bed from which the cabbages were taken. In taking up, we use a transplanting trowel, and are careful to get under the plants so as not to injure the roots. If you take hold of a plant and pull it out of the ground, you destroy all of the fine roots, and thus prevent it from growing for a week or ten days, or until it re-supplies itself with them. In selecting ground for cabbages, take that which has been made rich with stable or barn-yard manure. It is folly to plant cabbages in poor land, or expect good solid heads without manure.

In the latter part of May, or as soon as all danger from frosts is over, you may remove tomatoes and other tender plants to the open ground. Tomatoes fruit best and earliest on clay land, manured, but do very well in our black swales without manure. They should be set in rows both ways, and not less than six feet apart each way, thus giving them plenty of air and light, which is the best preventive against rot. Just observe the practice of good market gardeners, and on land, too, which they would not rent for $20 per acre per annum, and you will see they do not crowd their tomato vines so close that they run into each other.—Three or four feet apart each way is room enough for egg plant or peppers, for both of which the soil should be rich by being well manured. A little hen or bird manure, put in or about the hills, is very good. Directions for sprouting sweet potatoes, and their after culture, we will give in next number of the Ohio Cultivator.

G. S. Innis.

Brilliant Stucco Whitewash.

Many have heard of the brilliant stucco whitewash on the east end of the President's house at Washington. The following is a recipe for it, as gleaned from the *National Intelligencer*, with some additional improvements learned by experiments:

"Take half a bushel of nice unslaked lime, slake it with boiling water, cover it during the process to keep in the steam.

Strain the liquid through a fine sieve or strainer, and add to it a peck of salt, previously well dissolved in water; three pounds of ground rice, boiled to a thin paste, and stirred in boiling hot; half a pound of powdered Spanish whiting, and a pound of clean glue, which has been previously dissolved by soaking it well; and then hanging it over a slow fire, in a small kettle with a large one filled with water. Add five gallons of hot water to the mixture, stir it well, and let it stand a few days covered from the dirt.

It should be put on right hot; for this purpose it can be kept in a kettle on a portable furnace. It is said that about a pint of this mixture will cover a square yard upon the outside of a house if properly applied. Brushes more or less small may be used according to the neatness of the job required. It answers as well as oil paint for wood, brick or stone, and is cheaper. It retains its brilliancy for many years. There is nothing of the kind that will compare with it, either for inside or outside walls.

Coloring matter may be put in, and made of any shade you like. Spanish brown stirred in will make red pink, more or less deep according to the quantity. A delicate tinge of this is very pretty for inside walls.—Finely pulverized common clay, well mixed Spanish brown, makes reddish stone color. Yellow ochre stirred in makes yellow wash, but chrome goes further and makes a color generally esteemed prettier. In all these cases the darkness of the shades of course is determined by the quantity of coloring used. It is difficult to make rules because tastes are different; it would be best to try experiments on shingle and let it dry. We have been told that green must not be mixed with lime. The lime destroys the color, and the color has an effect on the whitewash, which makes it crack and peel.

When walls have been badly smoked, and you wish to have them a clean white, it is well to squeeze indigo plentifully through a bag into the water you use, before it is stirred in the whole mixture. If a larger quantity than five gallons be wanted, the same proportions should be observed.

Every girl who intends to qualify for marriage, should go through a course of cookery. Unfortunately, but few wives are able to dress anything but themselves.

Pruning Apple Trees, etc.

We are requested to answer the following questions:

1st. "When is the most proper time to prune apple trees?

2nd. "How high should the main stem be to the first limbs?

3rd. "What application is best to prevent rotting where large branches have been cut off."

1st. When trees are transplanted from the nursery to the orchard, they should be pruned, removing the branches so as to lay the foundation for a *clear, open head,* and shortening all of the remaining shoots to three or four buds of the previous season's growth. The object of this cutting back, is to compensate for the loss of roots and fibres occasioned in removal from the nursery, and thus establishing an *equilibrium* between the demand of moisture by the leaves, and the supply from the roots. There is an immense amount of moisture given off from the leaves of a tree, during the day, and when, from mutilation, or partial loss of the roots in digging, this supply is not kept up, the tree lingers and often dies in consequence. After this, our practice is to prune at any time when a branch is discovered to start from an improper place, consistent with the design of the head. If this course is practiced for five or six years, after the trees are set, but little pruning will be necessary, and will be done when the branches are so small as to be proper at any time. But if an orchard has been neglected, and considerable pruning is thought necessary, it should be done with caution, and the Spring is the best time to do it, so that the wounds may heal immediately. When the pruning has been thus deferred, till the trees have gained considerable size, we would never advise to cut off large branches, unless they have become defective, or are interferring with others to the positive injury of the tree, but rather to thin out the smaller branches nearer the extremities. The undue pruning of an established tree produces opposite evils to those resulting from having a full head, when a tree that has been removed from the nursery with the loss of two-thirds of its roots, and a still larger proportion of its spongioles, through which alone the tree derived its nourishment from the soil.

It is painful to go through the country and witness the reckless, and we might say, wanton decapitation of thrifty apple trees, apparently without an object or design; at any rate none founded on reason, nor with the remotest knowledge of the laws of vegetable physiology. Nature, after she has been subjected to this kind of *butchering*, ever true to herself, attempts to repair the injury, and at once sends up half a dozen "*water sprouts*" to take the place of the branch that has been destroyed, and these assume an upright growth, giving a less perfect form to the tree, and leaving the mutilated stumps exposed to decay, which ultimately leads to the premature death of the tree.

2nd. The height of the main stem of the tree should be governed, somewhat, by the habit of the growth of the particular variety; for instance, the Belleflower, Pennock, and various other kinds, grow with drooping branches. These should be trained to about four feet to the commencement of the head. Trees of a more upright growth should never be trained to more than *half this height*. The error has long prevailed of training fruit trees, apple, pear, and peach, too high. The trees, generally assume a leaning position, with the prevailing winds. The fruit is more difficult to gather, and is also more liable to injury in falling, while we know of but one advantage that can be claimed in favor of high training, and that is, rendering it more convenient for cultivating with the horse and plow, or cultivator. While the trees are small the team can be run quite near them, and the weeds and grass that cannot be reached may be easily removed with the hoe, and in a few years the shade of the tree will prevent a vigorous growth of them about the stem, so that in fact there is nothing gained by running the trees up to the unnatural height of beanpoles, but much is lost. To form a handsome head to a fruit tree, the work should be commenced in the nursery. The stem should be cut back so as to cause the head to start at the point we have named. When this has not been done, the orchardist, in transplanting, should have the object in view, and cut back the stem accordingly in order to encourage the growth of a lower tier of branches. For this reason, we prefer to plant two year old trees, when well grown, to those of a larger size that have been improperly trained in nursery.

3rd. From what we have said above, large branches will seldom require to be removed. But when, through previous neglect, it becomes necessary, let the branch be removed with a sharp saw, and near to the body of the tree. Like the amputation of a member from an animal subject, let it be done with skill, and only in extreme cases of necessity. The best application to such wounds is a solution of shellack in alcohol at about the consistence of common paint, applied with a brush or sponge, after the outside has been slightly dried. Place a quantity of shellack in a bottle of alcohol and set it in a warm place and shake it occasionally, and in a few days it will be ready for use. Experience will suggest the proportions. Keep the bottle closely corked, and it will be fit for use for years.—*Southern Homestead.*

From the Transactions of the North Carolina State Agricultural Society.

AN ESSAY
ON
Horizontal Plowing & Hill-Side Ditching.
BY
NICHOLAS T. SORSBY, M.D., *of Alabama.*

(Concluded from April No., page 216.)

SECTION VIII.

Philosophy of the Grading Method.

Surface drainage is one of the most important operations connected with the tillage of the Southern soil. The value of the grading method cannot be over-estimated. It has to contend with a troublesome element, that is a moveable element, always seeking its level, whose particles have a great affinity for each other, and running together whenever they can, thus accumulating in a mass, and increasing its volume and velocity when in motion. This element we wish to control with a level and the plow on the surface of arable land, and derive all the advantages of it we can as a feeder of plants, and at the same time, get rid of the excess that would prove injurious to the soil and growing plants. Nature does this for us in some soils and teaches us how to do it for ourselves in others. It sinks the water in porous soils, and stores it up for future use of plants, and removes it when superabundant, from undulating close clay soils before it does injury to the plants that do not require it, teaching us to level porous thirsty soils, and deepen and drain compact close soils. We should study carefully the operations of nature, and apply its beautiful principles to the present subject, and conform them to the limited capacity of the uneducated minds of men. Very few fields of one hundred acres have the same inclination of surface, and one variety and depth of soil. Land slopes in every direction, and each hill-side or plane of inclination requires sometimes a different mode of drainage and a different method of culture.

In examining a field, we find some acres requiring the level culture, others again, one method of grading, and another a different method, and so on perhaps, through the whole list of the different methods of grading. It would be improper, then, to employ one system alone for every part of the field. The different methods should be applied according to the demands of the land. Science should guide us, and the one-system horizontalizer is led into error by his efforts to apply it to all localities and inclinations of surface of land. We should be acquainted with all the systems, and not make a hobby of any one. Better try first one and then another, in experimenting, and select those that are best and most applicable to the land. If we find a straight row more convenient and better than a crooked one, if it be correct, adopt it, without sticking to the idea that the horizontal culture consists of a system of crooked rows. Experience will soon teach the new beginner the degree of grade necessary to give to his rows and drains, and the number of drains or ditches to use, to drain a certain area of land. The grade to the rows and drains is governed by the kind of soil, the declivity of the land, the extent of the surface to be drained, and the method of horizontaling they are intended to aid. If the level culture, with drains, be adopted, a few shallow guard-drains with a fall of from one to two inches for every span of the level, may answer in moderately close clay soils, and less fall in porous sandy soils. If the grading method be adopted, the fall of the rows and the drains depends upon the kind of method of plowing used, and the nature of the soil cultivated. We should recollect, that the washing power of water descending a hill recently plowed, is dependent upon the declivity and the length of the hill, the depth of the plowing, the character of the soil, and the quantity of water in motion. Hence, the greater the fall, the longer the hill, the shallower the plowing, the more porous and light the soil, and the greater the volume of water, the more the land will be washed. If the grade be not sufficient and the dimensions great enough, the rows are apt to be choked and broken. A regular and proper grade must be given, and if an error be committed, it should be on the side of two little fall. If the grade be too much the rows will wash into gulleys. Guard-drains and hill-side ditches should have grade and capacity enough to drain the land speedily and effectually, without having their sides and bottoms washed too much. With a proper fall and dimensions, they may be used to convey sand to fill up gullies, basins, and deposit it convenient to cover galled places.

SECTION IX.

Advantages of the Grading Method.

It possesses all the advantages of surface drainage of arable soils in a simple and the best possible manner without doing serious damage to the land. It is the best method ever invented to assist in breaking up galls and gullies, and filling up depressions in the the land, and the beds of old ditches and branches, as well as ponds, basins and bogs, and in aiding the plow and the hoe in restoring worn out soils.

It possesses, also, many of the advantages of the level culture.

Disadvantages of the Method.

By careless construction of drains, and neglecting to attend to them afterwards, they are liable to choke and break, and wash the land below them into gullies. When they have too much fall, each row or drain is apt to wash into a gully, and do harm to land below their mouths by covering it with sand. They distribute water irregularly, and where not demanded, drying the ridges and hills too much, and drowning the bottoms. Upon the whole they are of minor importance compared to the benefits of drainage.

SECTION X.

Subsoil Plowing

Means loosening the subsoil with a plow without any mould-board to turn it up.

We have seen, that Nature teaches us three important operations that are essential to the perfection of the horizontal culture, viz: to open, to deepen and to drain the soil.

An open, deep and dry soil, we all know, can be cultivated to better advantage and profit, by either the level culture or grading method, than a close, shallow and wet soil by any method. The latter requires much labor and time to open, deepen and drain it, and if a good soil the labor pays, if a bad soil the labor is often lost.

Under the soil of some stiff red clay lands, long cultivated, originally good, there frequently exists a stratum of compact clay and sand, called a hard-pan, formed by the treading of the stock and sole of the plow, cemeted together by oxide of iron, clay and fine sand. It exists, sometimes, in gravelly soils, but less frequently than in clay soils. Wherever it prevails it makes the land hard to cultivate, and it produces sorry crops. It is always on extremes of wetness or dryness. Such land is difficult to horizontalize.

Again, the plow forms in clay land, on the subsoil, small gutters or channels, into which the water sinks, accumulates, and flows and washes the soil, obstructs the work of the horizontalizer by breaking the ridges and undermining the banks of drains and ditches when they are not made deep enough on hill sides to extend below these channels.

The subsoil plow aids very much the horizontal culture by breaking up the hard pan, the gutters or underground water furrows, galls and gullies, on clay lands; it opens, deepens, pulverizes the subsoil, drains the surface soil by sinking the water, and extends the area of air, manures, and the roots of plants, and thus produces a decided amelioration of the soil and subsoil.

The best time to do the work is winter and spring, when the land is moist and soft, and when time can be taken to do it well. The most effectual plan is to open a furrow with a two-horse plow, with a good turning mould-board, and follow in the same furrow with the two-horse subsoil plow, as deep as both plows can be drawn. If the time cannot be spared to run so many subsoil furrows, half the number will answer a good purpose. An expeditious plan for corn land is to open deep, the water furrow between the ridges, with a scooter plow, and follow it with the subsoil plow; put in the manure, and bed out with scooters and shovels, finishing with a turning plow to make a good water furrow.

When employed in lands for small grain the subsoil plow can be run to advantage in the old water furrow, which is the centre of the land when plowed out, and also in the new water furrow left open. We need not fear subsoiling clay and gravelly soils when hard and compact, especially when old and much worn.

SECTION XI.

Trench Plowing.

This differs from subsoiling, by raising up the subsoil, and mixing it with the surface soil, with a turning plow following in the furrow of another turning plow. It brings up subsoil, disintegrates the hard-pan and distributes it through the surface soil. It is of great assistance to the horizontal culture to break up the gullies, gall and hard-pan, and thus lay the foundation of the process of restoring the fertility of worn out lands.

If the soil was originally of a good quality, and the subsoil of the same quality, trench plowing is of much advantage to the land to deepen and mix the two. But if the land be poor, and the subsoil poor red clay, the trenching should be done by a scooter plow, following in the furrow of the turning plow with the view of breaking up the subsoil, and pulverizing it, without mixing them too much. Mixing a poor clay with a poor soil is bad policy, unless much manure is added to improve it. Subsoiling and trench-plowing are often confounded with each other, but are quite different operations.

SECTION XII.

Land-Galls.

These are abrasions of the soil, by rain water removing the soil of clay lands long cultivated by the old wash away method, and leaving the clay exposed. They might be very properly called land-sores, of a virulent character, and hard to heal. The best way to treat them, is to scarify them deep every spring, sow them down in peas, plow them in the fall, and sow in rye; repeat the same operation next year, cover them with leaves, stalks, long manure of any kind, and the third year a tolerable crop of corn or cotton may be grown on them. To manage them to the best advantage, they should be surrounded, or cut off to themselves, by guard-drains, or hill-side ditches.

SECTION XIII.

Gullies.

These are open water-channels, caused by rain water and careless up and down hill plowing. They are hideous objects to the eye of a scientific and practical farmer, and should receive the condemnation of all good husbandmen.

There are many ways of filling them up, but in doing so, sometimes two are made in place of one, unless it be properly done and aided by the horizontal culture. The land requires to be well graded and the direction of the water changed, and not be permitted to flow so abundantly down the gullies as before. When they are less than three feet deep, they may be stopped and filled up in two or three years, in this way: Every twenty steps drive up stobs or oak boards across and in the gulley, close together, to catch and hold the dirt and water in part; then, throw in leaves, tussucks of grass, corn and cotton stalks, pine straw, pine tops, with the laps up hill, and plow up and down on each side of it, and drag in as much dirt as possible with hoes. Sow them in peas and rye, and let grass grow in them. Plow horizontally across, keeping the same regular grade in passing them; to do so, the rows will make a curve up and down.

Large gullies will require more labor and time to fill them up. Cut a ditch across them at proper distances apart, and pile logs on each other in the ditch, until the top log reaches above the banks of the gully. Now gather all the rubbish, stumps, stones, logs, leaves, pine saplings, with the laps up hill, into the gully, and draw in all the dirt convenient and pack it against the logs, and on the pine tops, so as to make a dam. The drains and hill-side ditches can be emptied into them, and supply dirt to fill them up. Allow grass, weeds, peas, and small grain to grow in them. In a few years they will be filled up, and bear some crop every year to hide them from the gaze of a neat farmer.

SECTION XIV.

Guard-Drains and Hill-Side Ditches.

Guard-drains are shallow, open water channels, made with the plow and hoe, on arable land, laid off with a leveling instrument, with a regular and gentle grade, directed around undulating ridges and hill-sides, for the purpose of receiving and conveying away superfluous rain water.

Hill-side ditches are a variety of guard, or catch-water ditches, but intended to operate more effectually than they, by having a greater capacity and grade, in order to remove a greater volume of water in a shorter time from hilly lands. They are a part of the system of horizontal culture, and are used to aid and protect it, and correct its defects. We may very properly term them the safety-valves of that system, when properly constructed, and waste-ways when improperly constructed.

They are valuable adjuncts to the horizontal culture, and especially to the grading methods, when made according to correct principles of hydraulics. On loose, sandy lands, they should be dispensed with whenever it can be done with safety, and as few as possible be used, and they as far apart from each other, and as short as the nature of the land will admit of, to effect the desired object. Clay lands, that have been plowed up and down hill, in straight rows for years, and a good deal abraded and washed into gullies, require the ditches and drains to be well made. It takes two or three years sometimes to break up the old water-furrows and gullies, and turn the curve of the water, unless deep plowing be combined with the grading method. Guard-drains usually answer the purpose on gently undulating lands.

Hill-side ditches are best on hilly lands. Inexperienced horizontalizers would do well in commencing the horizontal culture, to employ drains to protect their imperfect work. They should be made as short as possible, avoiding all abrupt curves or sudden bends, and directed around ridges or hills from a medium point, dividing the water and discharging it on both sides of the ridge or hill into a ditch, gully, branch, or outside of the field, where no damage to adjoining lands may be done. The fall should be gradual and uniform, and just sufficient to discharge the water without washing the sides and bottoms of the drains.

The size of drains and ditches should be determined by reference to a variety of circircumstances, the combined influence of which, although not reducible to any very exact rules, may generally be estimated in practice. We must consider 1st, the *annual* quantity of rain; 2d, the quantity which falls on the land during a heavy rain; 3d, the nature of the soil as to porosity or compactness; 4th, the inclination of land; and 5th, the length of slopes and extent of surface to be drained. Every horizontalizer must take these things into consideration and judge for himself.

A general and important rule as to the capacity of drains is, that they should exceed rather than fall short of the dimensions ordinarily required to discharge the quantity of water for which provision is to be made. A correct knowledge of the character of the soil and the action of water upon it is necessary to determine the depth of the drains. Thus: a light, deep, porous, sandy soil, will absorb water as fast as it falls, if it lies level; if undulating, it will absorb it not so fast, and the deeper and more porous the soil and sub-soil, the more and faster it will absorb. On the contrary, a shallow, sandy soil on a clay sub-soil and clay lands, will absorb less water, and more slowly, and more of it will pass off. It will follow the under-ground plow-furrows when absorbed, and the drains should extend below those furrows to catch the water. The close clay soils, and the stiff lime lands absorb water slowly, and if they be deep, the drains should extend below the soil, and should be nearer together than in porous soils.

The kind of drains to be used, their depth and distance apart, can be ascertained by experiment alone. It is safest for the new beginner to follow the example of those who have tested them on similar soil to his, and where they have been found to answer well.

The following scale of the depths and distances of drains and ditches, may give an idea of what they require, according to the classification of soils into compact, medium, and porous varieties, each of which may be subdivided into several degrees of porosity and retentiveness:

CHARACTER OF SOILS.					DRAINS.	
NOT SUBSOILED.	DEPTH OF SOILS.		DEPTH OF DRAINS.		KIND OF DRAINS.	DISTANCE APART.
PORUS.	Feet.	Inch's.	Feet.	Inch's.		According to the declivity of land.
Light loam, (fresh land.) / Sandy " " "	1	00	0	10	Guard-Drains.	Wide apart.
Light gravelly Sand,.... / Coarse gravelly Sand,...	0	10	0	12	Guard-Drains.	Wide apart.
MEDIUM.						
Clayey Loam,...........	0	8	0	12	Guard-Drains.	Not so wide apart.
Gravelly Loam .... / Friable Loam,..........	0	10	0	10	Guard-Drains.	Not so wide apart.
COMPACT.						Need subsoiling.
Tenacious Clay,..........	0	6	1	00	Hill-Side Ditches.	Close together.
Friable Clay.............	0	8	0	12	" " "	" "
Soft Free Clay,..........	0	10	1	00	" " "	Not so close.

If the land be subsoiled, the drains must be deepened, and made wider apart. The tenacious clays are not very commonly cultivated in the South. They are too wet for cotton.

SECTION XV.

Drill Husbandry

By the ridge and furrow system, in contradistinction to the check and hill method, is indispensable to the horizontal culture. Ridging and bedding up land is so familiar to every plowman in the South, that little need be said relative to the manner in which it should be done. They are made both by shallow and deep plowing. We prefer shallow plowing and flat beds, in new ground, stubble or sward land, and in porous light sandy, and loose gravelly soils. Deep plowing is best in old hard upland clay soils, (that need deepening and opening,) in bald prairie lands, and in low wet lands, of both kinds.

The height of ridges and lands are dependent upon the kind of culture, the crop grown, and the character of the soil.

For potatoes, we desire them high when the plants are set, and when the crop is laid by.

For corn, we prefer them flat in dry uplands, higher in lowlands, with clean water furrows.

For cotton, in fresh land and porous alluvial, and light sandy lands, moderately flat beds may answer very well. They are regulated by the width of the beds. In clay lands, the cotton beds should be high and narrow, and the water furrows deep and clean. We prefer not to plant cotton in wet land, but if it be done, high beds well drained, is the only remedy against the disastrous effects of water. The cotton beds are made close or wide, according to the quality, and productiveness of the land. In rich river bottoms, and black cane-brake lands, they vary from five to eight feet wide. Thin and medium quality upland, sandy and prairie lands, they vary from three to four feet in width; some poor lands, they are as near as two and a half feet apart.

We cultivate our land in ridges for corn, cotton, peas, and potatoes; the ridges vary in height and distance according to the quality, and dryness of the soil. They are from six to fourteen inches high, and from three to four feet wide apart, that is from crown to crown. When desiring to sow small grain on land, in ridges, we sow the grain, and plow four or five ridges into a land, and preserve the direction of the rows.

We sometimes sow cotton land in oats and rye, and throw four turning plow furrows on the grain, and plow out the stalks with a large two-horse shovel, thereby making a flat bed, drained by the water furrow, and preserving the width of the beds.

We sometimes sow rye in the fall in cotton land, and run two sweep furrows in each row. In very porous land, if the rye be sown just before cattle are turned in the field, no sweep furrow need be run.

SECTION XVI.

The Advantages of the Ridge and Furrow System

Are, that when the ridges or beds are well put up without two great an inclination, it facilitates drainage by breaking up the crust formed on the surface of land that is sometimes so close and tenacious as to prevent the water from sinking into the subsoil beneath the roots of plants; it exposes a greater surface and depth of land to the action of the sun and air; it enables land to be cultivated that cannot be cultivated on the hill and check method, or any other method; it renders land drier and less subject to the destructive effects of wet seasons; it makes land easier to work at all times with less injury to the crops; it renders the plowing of spring and summer less hazardous and laborious; the tillage of spring and summer more certain and effectual; it secures to the crops a nice, mellow bed of loose, dry and warm earth to grow and expand in above the cold and wet subsoil; in fact, it produces an artificial climate, which improves the health, and hastens the growth of young and tender plants that demand such especial care during spring; and finally, it prevents land from washing away, and is the basis and support of the horizontal culture.

SECTION XVII.

The Check and Hill Method.

This method answers a good purpose on very loose, porous, level pine lands, for potatoes and ground peas, cultivated mostly with the hoe. It is objectionable to the horizontal culture because it upsets and breaks up the horizontal rows, and turns the water loose, on the land, and destroys the effect desired by the horizontal system.

SECTION XVIII.

Plowing Straight Rows by Stakes.

This method has been pursued by farmers, for ages, and is the favorite plan with the majority of them at this time.

The great ambition of the plowman who lays off the rows, is to make them perfectly straight, regardless of hill or valley, across the field from fence to fence; nothing but a ditch stops him.

It is astonishing to see the accuracy with which it can be done by a few stakes set in a line with each other. Of course, the rows make beautiful drains to dry the hills, and cover up and drown the valleys with sand and water. The hill tops and sides are in a few years cut into gullies, and the soil precipitated into the valleys to impoverish them with sand and clay.

This is truly, the *wash-away and killing method*, and should be abandoned by every farmer, or planter who cultivates hilly lands. Level plains of sandy land, can be plowed in this manner very well, without doing much injury to the soil, particularly, if the rows are changed and crossed every year or two. We adopt straight rows whenever we can run them on a level.

SECTION XIX.

Horizontalizing by the Eye.

Instead of running the rows up and

down hill, in straight lines, this method directs them around the hills, and diagonally across them, with a considerable fall to them.

If they are directed diagonally across the fields, and are desired to be straight, they are laid off by stakes. If intended to circle the hill, the horizontalizer walks around the way he desires the rows to run, and the plowman follows him and lays off a guide-row. The rows are then laid off by the guide-rows. This is guess work, and very inaccurate. We have seen a very intelligent planter, who was familiar with the horizontal culture, circle a basin badly gullied, on horseback, followed by two plowmen, one laying off after the other. The basin was surrounded by a guard-drain that kept the water from the adjoining land out of it, and conducted it off out of the field. The plowmen and the horizontalizer were below this drain. As they passed over the gullies, it was "gee Ben, haw Dick, haw Ben, gee Dick," sometimes in rapid succession, and was very amusing. We called this work a horizontal farce.

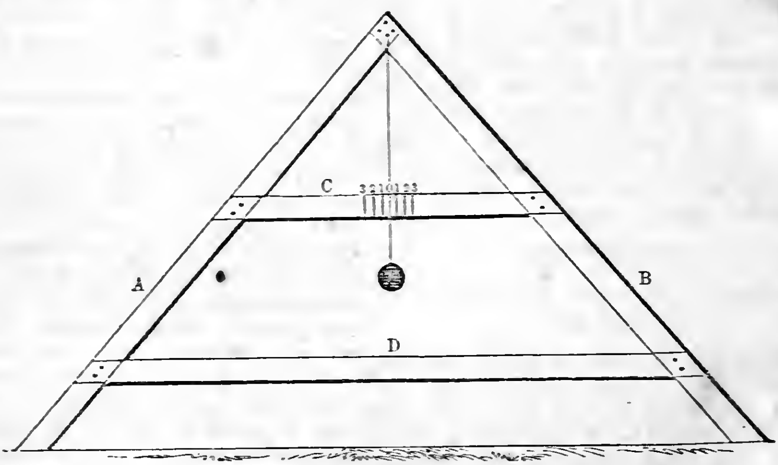
The rows were laid off like the track of a snake in the sand, and had they not been protected by the guard-drain, they would have been cut into many troublesome gullies and galls.

SECTION XX.

The Span or Rafter Level.

Of the many leveling instruments in use, among Horizontalizers, the above is the best, because, it is the simplest, the easiest of application, and is most generally employed. Besides, any carpenter can make it.

In horizontalizing land it is necessary to success, to keep a perfect level of the rows in the level culture, and a uniform fall in them, and the drains in the grading system. The most convenient and handy level is made with a span of 12 feet 4½ inches and 6 feet high. This span is ¾ of a perch: So that we can readily calculate the length of the rows and the ditches, and estimate the rise or fall of them per perch.



THE SPAN OR RAFTER-LEVEL.

EXPLANATION OF THE FIGURE.—To construct this level, take two strips of dressed heart pine plank, well seasoned, A B, 3 inches wide, ¾ of an inch thick, and 12 feet 6 inches long. Another strip for a foot brace, 1½ inches wide, ¾ of an inch thick, and 11 feet long. D.

Also, another for a middle brace, or graduated bar, 2 inches wide, ¾ of an inch thick, and 6 feet long. C. Lap one end of A and B together, let them into each other and make them secure with wood screws, so that when fast the other ends of the strips may be 12 feet 4½ inches apart from outside to outside, and the level, when finished, be 6 feet high.

Make the foot brace, D, fast to these two strips, one foot from the ground, when the level is standing on its feet.

Make the middle brace, C, fast to the same strips, three feet from the top, and saw off the ends of all, so that the level, when completed, will have the dimensions, and span the difference above mentioned. Paint it, and when dry graduate it thus, viz: Suspend a plumb line with an ounce lead from the centre of the top, and let the bob extend two inches below the middle brace.

With a spirit level find a perfect level on a plank, and stand the Rafter Level on it. Mark where the plumb line crosses the cross bar with a pencil, and the places occupied by the feet; change the feet, and put each in the place occupied by the other; mark again with a pencil where the plumb line crosses the bar; if it crosses exactly in the place it crossed before, that is the centre of the level, and the true line; if not, the exact distance half way between the two lines is the level line. To be very exact, the assistance of a spirit level will find it. The true line of level being found, mark on the top of the bar 0, and make a plain line on the front side of the bar to correspond with 0. Now put a ½ inch block under the left foot of the level, and mark where the line settles, and ½ on the top of the bar; remove the ½ inch block, and put a 1 inch block under that foot, and mark where the line crosses the bar, and 1 on top of the bar; proceed in that manner until it is graduated to 6 inches. Repeat the same process for the right foot, and other side of the line on the bar, and the level will be graduated ready for work.

SECTION XXI.

Application of the Rafter Level to the Level Culture.

The manner of using the level is the same for both methods, with this difference: for the *Level Method* the rows are laid off, and plowed on a dead level, whilst for the *Grading Method*, a fall is given to the rows and drains.

It is necessary to be more accurate, and apply the level oftener for the level method, than for the grading method.

Before going to work, we must determine first, upon the kind of crop to be cultivated; second, the character of the soil; third, the inclination of the land, whether comparatively level planes, undulating ridges or hills; and fourth, the method of horizontalizing desired.

To illustrate and explain the different methods, we select a forty-five acre field, which we call the Gin-house field. Upon examining it, we find a plane, a hill, a ridge, a basin, a pond, and the balance undulating irregular surfaces, and wet flats and ditches. The soil is grey, and dark sandy, on a yellow and red clay subsoil, of medium quality, that has been much abused by bad plowing, and constant cropping. It presents the variety of soil, and undulations of surface, necessary to explain our subject fully.

It was horizontalized by me in 1851.

SECTION XXII.

To Horizontalize a Plane by the Eye on the Straight Row Method.

We will go to the field, with the level well graduated, accompanied by a small boy, who carries a bundle of canes or green sticks, some one foot, and some six feet long. A sensible plowman, with a quick, tractable mule; with a scooter or rooter plow, and a hill-side mould-board plow follows.

To try the skill of the plowman, and the temper and spirit of the mule, we select a plane on which the Gin-house stands, for operation. We suppose the field to be a stubble-field, having been always plowed up and down hill. Having determined upon the direction of the rows, and the points of departure and termination for them, we direct the plowman how to proceed—order him to set his stakes, "be sure you are right, and then go ahead," and lay off four feet rows. As negroes' memories are short, and they are careless, and mules slow and stubborn, we wait to see him started. If he proves to be inefficient, and lays off crooked rows, irregular distances apart, and can do no better, we dismiss him, as not trusty and skilful, and procure another plowman, because much depends upon his skill for our work to succeed. Should he answer the purpose, we leave him and go hence to

SECTION XXIII.

Circle the Round Basin.

This basin has been partially drained by a ditch passing through it, and emptying into the main ditch, but never successfully, because the ditch has never been deep enough, and the margins of the basin are too high to admit of deepening it enough without much labor.

We desire to circle it on a level, so that each row may hold its water, and keep it out of the ditch as much as possible.

We will commence at the ditch, at the east side of the basin, above the margin of the basin, where the land is comparatively level, to lay off a guide-row that may embrace all the sloping land inside of it.

We set the feet of the level on similar ground, and move the forefoot, that is to lead off, until the plummet line, or spirit bubble, indicates the true level. We stick down a long cane by the side of the plumb for the guide stake. We then move the level and put the hindfoot by the side of the stake, and move the forefoot from side to side, until the true level is found; we move it again, and put the hindfoot exactly in the place the forefoot occupied, and find the level again; we stick a short cane down under the plumb; we move the level again, and proceed in the same manner, getting the level every time, and sticking a short cane down every third, and a long cane down every sixth span of the level, until we surround the basin, and return to the point, or near the place we started from, and we put down a guide stake there. The level may return to the ditch above or below the first guide stake. It makes no difference, so the line is run correctly, where it returns to the ditch.

We now lay down the level and walk around and examine the stakes. We will, perhaps, find them standing very irregularly, not in a perfect curved line, but a little zigzag. A skilful horizontalizer can detect in a moment, by the eye, almost where the true line of level is, and can move the stakes and re-set them, so that the line will have a more regular curve; it being somewhere between the stakes, inside of some and outside of others. Having arranged the stakes to our fancy, we start at the guide stake, the plowman following, and we walk from stake to stake, the plow moving them as the mule throws them down, and the little boy picking them up, until we arrive at the last guide stake, which is likewise plowed up.

We have now laid off and plowed a circular row, not a perfect circle, and if there be no sudden curves in it, and it suits our fancy, we let it stand; but if we have any doubts about its accuracy, we take the level and try it, and if necessary, mark the inaccurate places, and run them over with the plow.

We now move the plowman on the inside of this guide row, and commence four feet from that row and run a row by it, the plowman carrying a four-feet measuring rod, with which he occasionally measures the distance between them to see that he keeps the proper distance; and thus he keeps around until he returns to the guide-stake. As the ditch is narrow and shallow he passes over it, takes another row, and goes around as before, on the basin side. We take the level and follow him, and test his row to see if it be correct, and if there be any variations of importance from a true level, we stop him and correct it. There are two or three ways of doing this. A very convenient way to keep the row going on around, is to widen the distance between the rows a little at one place, and narrow it at another. Or, if this cannot be done, we put in a short row beginning at the ditch and going around until the defect is corrected. We have then to start another row and lay off by that, which the plowman can do, and go round again. Sometimes it becomes necessary to widen or narrow two or three rows, or put in two or three short rows, before the defects are remedied.

In finishing the basin, the rows get shorter and shorter until we have to wind up with a few short straight rows run parallel with the ditch. This concludes the work inside. We now examine the first guide row and the land surrounding it, and if we see that it has not embraced all the sloping land, we run one or more rows on the outside of it, either entirely or partly around the basin, as the case demands. If the basin had no outlet by a ditch, we could commence to circle it, on either side, and go round and stop on returning to the guide stake, nearly opposite to it. We then get on the inside of it, and run the rows by it, as above stated. It is seldom that a guide row, on making a circle, returns and meets again. Sometimes, when we start to circle a basin, we commence so far above the margin of the slope, that the level goes off into the field instead of around the basin; in that event, we go lower down on the margin to commence, so that the row may go around the basin. But, if we find it necessary, after trying the level method for this basin, to protect the rows by a guard-drain from the water around oozing into them, we can lay off a guard-drain around it, to catch the water and discharge it into the ditch.

If we find, upon experiment, that the level culture is not applicable to the basin, we can try a grading method. This is sometimes the case.

The plowman beds up the land high in this basin, in the same way that he beds up straight rows of the same distance apart, except that he plows around the basin, and does not stop to turn round at the ditch until he is obliged to do so from the nature of the rows.

SECTION XXIV.

Horizontalizing a Hill on the Level Method. No. 1.

We will now work on the *Peach Tree Hill.** About an acre on the top of this hill is an uneven plane. The hill slopes North, East and South. There is a fence on the South and West, and a ditch on the North and East.

We can commence work almost any where, on the side or the top of the hill. For convenience of plowing we will begin on the top, not far from the angle of the fences, and lay off a level row from fence to fence. This is done in the same manner that we did for the basin, moving the level as there, and staking the row for a guide row. When done the plowman begins and plows it out. We test it and find it correct, and nearly straight. We put him to laying off four feet rows by it next to the fence. They become nearly straight before he finishes them. Whilst he is at work there, we step down thirty paces to the brow of the hill, and commence at the west fence and lay off another guide row, which makes a curve as it goes around to the south fence. We examine our stakes, re-set them, and the plowman plows it out. We test it with the level, and correct the errors with the plow.

The plowman, after finishing the first set of rows, has gone on the other side of his guide row, and is laying off by it. We watch and try his work with the level, and see that he keeps his distance. We find directly that the south end of his rows terminate at the fence, and the north ends at the second guide row just laid off, and unless his rows are on a level they will pour the water into this guide row, or by the side of the fence.

When he finishes this work he goes below the second guide row and lays off by that, and we go twenty steps below it, and lay off a third guide row. To do this we find two gullies to cross, made on the side of a fence that has been removed.* They have a ridge between them, on which the fence stood.

We call the hoe hands, not far off, shrubbing a ditch bank,† and send for a plowman with a turning plow, who is plowing in the first set of straight rows laid off by the eye; before he arrives the hoe hands have nearly filled the gully with shrubs, pieces of rails, tufts of grass, and the like substances, and have them ready for the dirt. The plowman goes up and down the ridges, and turns the dirt on and towards the gullies, and the hoes drag it on and fill up the gully with soil, tramping it down hard at the same time. This job done, we dismiss them for the present.

Unless there is a good reason to commence laying off this third guide row at the fence, we commence at the head, or beginning of the gullies, and lay off the row on one side, and then return to the starting place, and lay off on the other side of it. To do this work well, we first span the gullies and get the level to start with. We then lay off from the guide stake. We left the plowman on the lower side of the second guide row. When the plowman has laid off five or six rows by the second guide row, he lays off this third guide row. As he crosses the gullies he turns up the rows a little, and crosses in a curve, or else after the dirt settles in the gully the water might accumulate in it and make a break. This row is examined for correction, and corrected. The plowman now lays off rows on the upper side of this guide row until his work meets. If there be any short rows they are between the two last guide rows.

We go thirty paces below, and lay off a fourth guide row. This will be sufficient for this hill-side. The plowman lays it off, plows a few rows above it, and then a few rows below the third guide row, to throw the short rows between the two sets of rows. The balance of the rows are laid off by the

*See Fig. 1. Peach Tree Hill.

*Gullies should not be allowed by the side of fences. The fences, if possible, should be placed on level land, even if they are crooked. So should all plantation roads. All gullies should be stopped and filled up several days before the land is horizontalized, in order that they may receive a rain or two and settle the dirt in them.

†Ditch banks and fence corners should be shrubbed, and all sprouts on the field grubbed up before the horizontalizer goes to work, so that his work be not delayed.

last guide row. They get shorter and terminate between the angle of the ditches.*

SECTION XXV.

Horizontalizing this Hill by the 2d Level Method, with Guard-drains.

If we desired, we could make two guard-drains on this hill-side. One where the second guide-row is, at the brow of the hill, and the other where the fourth guide-row is, at the head of the gullies. We select these places, because the rows are more liable to break at the brow of the hill, and because the gullies have made breaks already. The first guard-drain would have less land to protect than the second, and its dimensions can, therefore, be less. We would make it ten inches deep, twelve inches wide, with a fall of one inch to the span of the level. The second drain would be twelve inches deep, and eighteen inches wide, and varying from one to three inches fall to the span of the level. To lay off the first one, we would commence at the south fence, at a certain place we desire to discharge the water. We might pass it under the fence into my neighbor's field, but as he has no corresponding drain, we let it go down the fence on our side.

We lay it off just as we do a circular row, except that we give an inch fall for every span of the level, and turn up the end at the west fence to catch any water that might descend by the side of the fence.

To lay off the second drain, we commence at the head of the gullies, because, if we commence at the fence, the drain might not pass them at that point, and to stop all breaks, gullies and washes, we must remove the cause of them first, and the cause is usually found above the commencement, and sometimes some distance to one side of the break. It sometimes requires a skilful eye to detect it. We commence at the gullies and give two inches fall, and proceed to the south fence, and at the fence we give three inches to the last span, to prevent the mouth of the drain from choking with trash and sand. We return to the gully, and run the other way to the west fence, and to the first span we give one and a half inches fall towards the south fence, then one inch to the next span, and continue that fall to the end, and turn it up two inches at the fence. We have a drain row with a fall of from one inch at the west fence to two, and lastly, three inches fall at the other end. The gully by the fence takes the water into the ditch below.

The drains having been laid off and staked, so as to know them, we lay the rows off on a level as above stated for No. 1. Should they break, the guard-drains will arrest the water, and remove it when desired. This will suffice to explain this method.

SECTION XXVI.

Horizontalizing this Hill by the Grading Method.—No. 1.

Suppose we desire to lay off this hill with a fall to the rows, without the aid of drains or hill-side ditches, we would commence as we did for the level method, and lay off the top of the hill on a level, as we find it convenient to discharge the water up there. Then we would lay off the first guide row at the brow of the hill as was done for the level method, but give a fall of one inch to the span of the level towards the south fence. We would lay off a second guide row, where the third guide row is for the level method, at the head of the gullies, and give the same fall as the one above. One more guide row would be sufficient. In plowing out the rows, the plowman lays off a few rows below the first and then a few above the second guide rows, so that the short rows, if any, may be midway between them. Now, if the short rows were to empty the water into any one of the long rows, it would cause that row to wash into a gully. So we plow them on a level. The same disaster would happen if the short rows were to terminate with a fall with a guide row. To avoid that mischief, we lay off long rows by the guide rows, so as to throw the short rows between the long rows as above mentioned.

The balance of the land can be plowed by the third guide row. But we find that they will terminate at the ditch, and there is no provision made for the exit of the

* See Fig. 1. Peach Tree Hill. This hill was laid off by this method in 1851, and the gulleys stopped in two years. As the rows next to the main ditch held water too long in the spring of the year, some of them have been altered so as to give a little fall to them, to empty the water at the fence, and then into the ditch. The hill-side was plowed as deep as one good mule could do it, and it has improved and produces much better than it did the first year with the same management.

water. We have either to lay off a drain by the side of the ditch, or lay off two rows next to the ditch and parallel to it, and make a drain of the water-furrow of the second row next to the field. This is the best plan if the land adjoining the ditch is higher than the adjoining land. The graded rows then empty into that furrow, and it is conveyed to the gully by the side of the fence, and from thence into the main ditch.

But should the ditch have too much fall to admit of the above plan, we should have to adopt some other plan to receive the water and to discharge it into the ditch. We should have to plow all the rows in the angle of the ditches on a level, or cut a guard-drain from the point of intersection of the ditch and south fence, to the north ditch, and give two inches fall to it, and empty the rows in the angle of the ditches into it.

SECTION XXVII.

Horizontalizing this Hill by the 2d Grading Method.

We have to lay off the drains, and then the rows with the same fall as that of the drains. Two drains in the same places as those for the level culture would answer. We would discharge the water at the same fence, and with a grade from one to two inches fall and twelve inches deep and fifteen inches wide. The rows are laid off by the drains as above stated. The first rows above and below the drains should be five feet distant, to give room for the channel and bank of the drains. All short rows should be between the long ones, and plowed on a level. If they terminated into a long one they would wash it, and if they terminated in the drain below they would fill it up with sand.

SECTION XXVIII.

Horizontalizing by the 3d Grading Method.

The rows by this method must discharge the water into the ditches. We cannot explain it so well here, unless we suppose the main ditches and the gully by the side of the fence to act as substitutes for the hill-side ditches. The drains are laid off as by the preceding method, but with more fall, to convey the water off more speedily. We then run the rows with a fall of one and a half inches into the ditches. Many of them will terminate at the ditches and many elsewhere. The liability to wash the land, and the trouble of discharging the water, would make it objectionable on this hill-side, but the method might answer a better purpose on other places.

SECTION XXIX.

Horizontalizing by the 4th Method.

The straight row method could be applied here; and with the protection of hill-side ditches with three inches fall to them, the land would not sustain as much damage as it has done by the same method without the ditches. For hill-side ditches would do for this hill-side, with a fall of from three to five inches, eighteen inches deep, and twenty-four wide. They must be capacious, to receive and retain the sand and water. After they are laid off and staked, the plowman sets his stakes, and plows up and down hill. In cultivating, the plowman has to raise his plow over the banks of the ditches as he passes them. This is troublesome, and he is likely to plow down the banks. This method would do mischief to this hill in a few years, and causes much labor to keep the drains clear, and the banks up. It would be very objectionable to this kind of land.

SECTION XXX.

Laying off Guard-drains and Hill-side Ditches with the Rafter Level.

A skilful horizontalizer can lay off these drains very well, with an Engineer's, and other levels of simple construction, but, as we write more especially for the instruction of new beginners of the art, we shall use the rafter level. We will select the Triangular Ridge, in the same field for operations. It lies North and South, near two hundred yards long, the apex of the triangle being East and the base West, about one hundred and fifty yards wide. The ridge inclines South, East and West, and the water naturally flows South, South-east, and South-west. It is bounded on the East by a fence, on the West by a ditch, on the North by a ditch, and on the South by a flat and drain.

We take the level and go on the ridge where the greatest slope South begins, and the greatest expansion East and West takes place, more properly, where the ridge begins to break up, and spread out into the flat, South, West and East. We set the level across the backbone of the ridge, and find the exact level, and stick a stake down by the side of the plumb-line, called the medium stake. We now go East, and place the hind foot by the side of the stake, and move the forefoot until the plumb-line settles at the half inch mark of fall on the graduated bar; we then move the level, and put the hindfoot exactly where the forefoot stood, and move the forefoot until the plumb-line settles at three-quarters of an inch fall on the bar; we move it again, and repeat the same movements until we get two and a half inches fall, and continue that fall to the last span of the level, and give it three inches fall; we finally turn down the level to the corner of the fence to six inches fall, so as to give the drain a sufficient curve to catch the water descending in a gully by the side of the fence, and convey it out without breaking the bank of the ditch. We return then to the medium stake, and proceed exactly in the same way for this part of the drain, as we did for the preceding part, until we get to the wet flat bordering the ditch, and from thence to the ditch we give three inches fall, and turn down the line, so that it may enter the ditch at an acute angle, to keep it from being choked at its mouth.

In laying off this line, we stick a long cane at every sixth, and a short one at every third, span of the level. We now lay down the level and examine the line. We find the stakes standing irregularly, some out and some inside of the line, rather zigzag. We re-set them by the eye, and order the plowman to follow us with the scooter plow. We walk from stake to stake, and just ahead of the mule, (who will soon learn to follow,) and leave them for him to knock down and the little boy to pick up. When we reach the end, at the ditch or fence, the plowman waits until we examine, with the level, his furrow, to see if it is correct; if there be any deviations from a correct and regular fall, we mark the places and direct the plowman to run them over. When it is done right, he takes the hill-side plow and retraces the line, throwing the furrow down hill, and thus continues throwing two or three more furrows in the same manner, and the hoe-hands drag out the dirt and form an embankment, making it higher at the fence and ditch, as the danger of its breaking is at those places. The plowman runs two or more furrows in the drain from each end up to the one-inch grade, and stops at that point, as it is deep enough there. When the ditch is finished, it will vary in depth from the medium stake to the ditch and to the fence from six to eighteen inches, and in width from eighteen to twenty-four inches.*

As the wet flat bordering the ditch the whole length of the ridge, needs draining, and as the land has been cross-plowed, and cut into ruts by the plow and water, we conclude to treat it after the method developed in the next section.

SECTION XXXI.

Horizontalizing with the Grading Method.

No. 3.

We give a fall to the rows of one inch to the dry land and three inches to the flat.

We commence and lay off a guide row where the wet and dry land join, at the hill-side ditch, and run north to the main ditch. This row is nearly straight. The plowman lays off all the rows by it to the main ditch in the wet land, with the same fall, and four feet apart. We go to the medium stake, and lay off a row North, on the backbone of the ridge, and find it varies but little from a straight line, and terminates at the North angle of the ridge at the ditch. We give it a fall from that point to the hill-side ditch of one inch to the span of the level. The plowman now lays off the rows on each side of this row by it, to the first guide row and to the fence. We see that it is done correctly, and put in a short row occasionally, to keep the correct and regular grade. In cultivating this ridge, we have had to make a few water-furrows across the rows in the wet flat with the plow, to drain it quicker during heavy showers. This is all the trouble we have had with this ridge since it was horizontalized.

SECTION XXXII.

Guard-Drains.

Below this hill-side ditch we have made three guard-drains, two on the East side of the ridge, and one on the West, the first one about fifty yards from the ditch, and the second one thirty yards below that one, both nearly parallel to the ditch. The first one about half the length of the ditch, and the second one not quite so long as the first; both have a grade of from one to three

* See Fig. 1, H. S. D. Triangular Ridge.

inches; they are twelve inches deep at the outlet, and six inches deep at the heads, and fourteen inches wide.

The one on the West side of the ridge is in the shape of a capital E, and the lower end of it is a double drain, receiving and discharging the water on both sides of it into the main ditch.

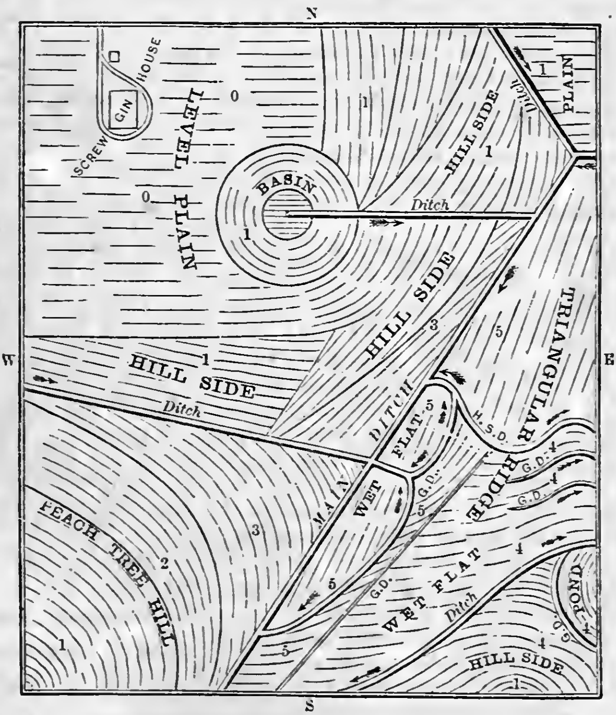
The two first are laid off in the same manner, commencing at the fence and proceeding up into the field.

The third drain we commence at the hill-side ditch, into which the drain discharges at the North end, and curves up and down, and then up and down again, to the main ditch South, and just before it reaches the main ditch it divides into two, separated merely by the bank. The middle of the E connects with a drain that leads to the ditch, making three outlets for this drain, one into the hill-side ditch, and two into the main ditch.

We need not describe the laying off and constructing of guard-drains, as it is the same as for the hill-side ditches.

We might write many more pages on this subject, to illustrate the minutiæ of this beautiful art, but as the *Essay* is already much longer than we desire, we refrain, but will illustrate it by a couple of *figures* for the examination and study of those who take sufficient interest in the art, and hope to make it sufficiently intelligible for the understandings of my readers.

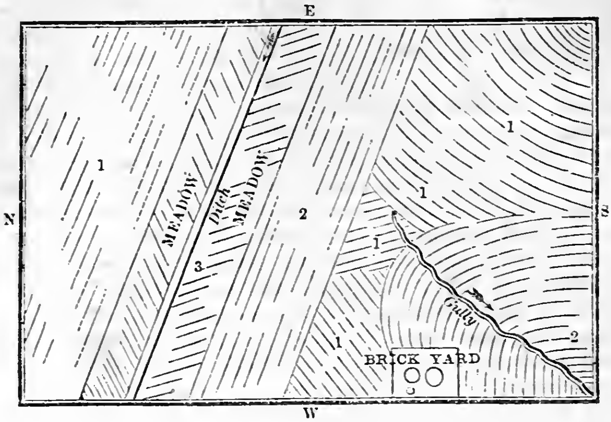
Fig. 1.—GIN HOUSE FIELD, 45 ACRES.



Explanation of the Figure.

0. Straight rows by the eye.
1. Level Method,..No. 1.
2. " " .... " 2.
3. Grading Method,.. " 1.
4. " " .... " 2.
5. " " .... " 3.
" " .... " 4. Not illustrated.

FIG. 2.—BRICK YARD FIELD, 10 ACRES.



EXPLANATION OF THE FIGURE.

1. Level Method..No. 1.
2. Grading Method,....................................... " 1.
2. " " .... " 3.

The gully was stopped in two years.

Hints to Farmers.

Be Systematic.—Here we have one of the first principles of successful agriculture. Let all your transactions be conducted in a business-like manner. Take note of every operation, whether you buy or sell, receive or disburse, sow or reap, make a promise or a bargain. To do this, it will be necessary to keep a diary, and we would say, do so, if for no other object than as a ready means of comparison.

Be Thorough.—Never half-do anything yourself, nor permit your men to glide over their labors. "If it is worth doing at all, it is worth doing well," would prove a *golden* maxim to thousands of farmers if they would not only adopt it as a portion of their creed, but exemplify its teachings in their daily life. Away with these *scratchers*—men that go *beneath the surface* are the kind wanted.

Leave your Land in good heart.—It should be the object of every tiller of the soil to leave his land in good condition after the removal of a crop, and, at the same time, obtain as remunerating returns as possible. This can be done only by husbanding all the sources of fertility upon the farm, and adding thereto in every available manner. This is the Alpha and Omega of progressive agriculture. Never boast of a "bank account" if it is obtained at the expense of your farm.

Study your Profession.—It is not alone the energy that wields the spade or holds the plow that insures success. The culture of the mind must go hand in hand with the culture of the soil. The relations of science to the farmer's calling are intimate. Good books are aids in the attainment of knowledge, but, never pin your faith on the *ipse dixit* of any individual—think, experiment and judge for yourself.

Stick to the farm.—Amid your plans for the future, never, for one moment, harbor the idea of bettering your condition by entering the arena of commercial life. Do not exchange a home of quiet, real enjoyment for the turmoil and illusion of a city residence. Barter not sweet repose for visions of empty wallets, nor let notes due on the morrow assume the prerogatives of the nightmare. Very poor comforters for care and anxiety are these little *realities* in the commercial world. *Stick to the farm.* What though hard labor be the every-day command, it is noble, healthful, and conducive to the full development of the whole man.—*Ohio Valley Farmer.*

For the Southern Planter.

The Dairy.

To the Executive Committee of the Va. State Agricultural Society.

GENTLEMEN:

It is a well known fact that throughout Virginia, even in those portions of the State where the natural and artificial grasses succeed as well as in the most favored of the Northern States, and where of course more or less attention is paid to grazing, very little attention is paid to dairy produce. During a portion of the year large quantities of butter are made in certain regions it is true, but this butter is in nine cases out of ten, an incidental product, rather than a primary object of production. The farmer must keep cows to breed from, and to supply milk and butter to his family; if more butter is made than the family requires, it is sold in the nearest town or at the country store, just as extra poultry would be. As to cheese, so little is made that none ever finds its way to market. True dairy husbandry, by which I mean the devotion of the farm to the production of butter or cheese, or both, so that these products become the almost exclusive sources of revenue to the farmer, is almost unknown amongst us. As a necessary consequence of this, the people of Virginia are paying an annual tax, amounting to several hundred thousand dollars, for dairy products to farmers of the Northern States; all of our large cities failing to secure a supply at home, are obliged to import large quantities of both butter and cheese, the first to make up for a deficient supply, and the second to supply the demand for an article that we do not produce at all.

The question naturally arises, does this failure to produce a sufficiency of two important farm products for home consumption, arise from our inability to produce them, resulting from peculiarities of soil or climate? or does it arise from the fact that, our farmers think there is more profit in growing grain, or grazing, than in the dairy? That by far the largest portion of the State, east of the Blue Ridge, is unsuited to the dairy, there can be no doubt, to attempt to make that a dairy country, would be the height of folly, but the case is very different in Western Virginia. The great Valley, and numerous other sections farther West, is pre-eminently a grass country, and it seems to me that, the true policy of many of its farmers would be, to turn their attention to the dairy and cultivate less grain, particularly wheat. I am led to this conclusion by various considerations, some of which I propose submitting to the committee in this communication, with the hope that I shall be able to show that, considerations of interest and policy, call for the introduction and wide extension of dairy husbandry in Western Virginia.

New York and Pennsylvania are celebrated for their fine butter and cheese, and the former is by far the greatest dairy State in the Union. The geological features of these States are the same precisely with those of Virginia, west of the Blue Ridge. A traveller starting from the Ridge and going westward, would come upon the same formations, and in the same order that he would if he started from the northern part of New York, and came southward into Pennsylvania. In both cases he would cross the great *Silurian*, *Devonian* and *Carboniferous*, or coal bearing series of strata, in regular order from the lowest, or oldest, to the highest, or most recent. Now since the soil has its origin in the rocks which underlie it, and its properties, both physical and chemical, are determined in a great degree by the nature of the particular formation to which it owes its origin, it follows that there must be a general resemblance between the soils of New York and Pennsylvania and Western Virginia; and that if care is taken to trace out the boundaries of particular formations, the boundaries and extent of the soils which bear a close resemblance to each other, will also be determined. For example, several of the Silusian deposites known in New York as the Utica Slate, Trenton Limestone, Chemung Group, &c., are extensively developed in that State; wide areas in the counties of Herkemer and Jefferson are covered by the first two, while equally extensive areas are occupied by the latter in Orange, Steuben, Chemung, &c. These counties comprise the very finest dairy regions of New York, and undoubtedly owe their peculiar fitness for this branch of husbandry to their geological features. By reference to the geological reports of Virginia, we find that these same formations, only known by different names, are extensively developed in our State; the first two throughout the length and breadth of the valley, the latter in Monroe, Greenbrier, Pocahontas and Randolph counties; now since the soils of New York, which rest upon these formations, are so pre-eminently suited to dairy farming, why it may be asked, should not the soils of the extensive region above referred to be equally well suited to it.

But we are not left to scientific induction alone, to show that the soils of this region of Virginia are as well suited to the dairy, as those of New York. It is a fact too well known to admit of question, that the Valley, Pocahontas, Monroe, and numerous other counties in Western Virginia, are fine grass growing regions, that they produce the finest grasses abundantly; and since the fitness of any region for dairy purposes, is determined by its capacity to produce the finer quality of grasses, it follows that the portions of the State above referred to, must be pre-eminently suited to dairy husbandry.

It may be objected that we are too far South, that our summer climate is too warm; to this I would say that, to the farmer who understands his business, and is properly prepared for the manufacture of butter or cheese, this can be no real objection. He can have cool spring-houses, butter and cheese-rooms, cool dry cellars, &c., as well as they can farther North, and while it may require a little more care, he can certainly keep the produce of the dairy sufficiently cool to have it in good condition for market. I know, from close personal observation, that our climate offers no real obstacle to dairy farming; that both butter and cheese of the very first quality can be made, and that they can be made to keep well. Granting, however, that the warmth of our climate requires more care on the part of the dairy farmer, it operates decidedly in our favor in other respects. We have good pasture earlier in the spring and later in the fall than they can have in the North, and our winters being both warmer and shorter than Northern winters, the expense of feeding, during that unproductive season, must be greatly diminished.

The extensive region referred to may, however, be very well adapted to the dairy, and yet dairy farming be unprofitable, or at least not so profitable as other systems; it is proper, therefore, that we should consider the question of the profits of dairying, as compared with the profits arising from the ordinary mode of farming in Western Virginia. Perhaps the strongest argument in favor of dairy farming is to be found in the fact, that in the State of New York, wherever the soil is suited to the purpose—and where it is no better suited to the growth of the finer grasses than our own—dairy farms are considered the most profitable; that the dairy products of New York are increasing from year to year, and that the State Agricultural Society, seeing from an early period of its existence, the importance of fostering this branch of husbandry, has by its premiums, by the dissemination of valuable information, &c., been very active in turning the attention of the farmers of New York to it. If now the dairy is so profitable in New York, can there be any reasonable ground for supposing that it would be less so with us, if properly managed? I think that I can show that it ought to be not only equally profitable, but more so. Hundreds of thousands of pounds of butter and cheese, both made by Northern farmers, are annually sold in our midst; if now the Northern farmer finds it profitable to produce these articles to send to us for consumption, surely it ought to be equally, if not more profitable, to our farmers, who have soils equally well suited to dairy farming, to produce them for so good a home market. With this fact of the importation of large quantities of Northern dairy products before us, taken in connection with what has been said in relation to the peculiar adaptation of many of our soils to the production of these articles, it must be shown that our farmers are enabled to turn their grass and grain to better account than Northern farmers can, before the argument in favor of dairy farming can be shown to be fallacious.

As this matter of profit is of primary importance, and as the information at my command was not of such a character as to enable me to compare dairy farming with the methods ordinarily practised in this region, I applied for information to the Secretary of the New York Agricultural Society, who has for years been exerting himself for the extension and improvement of dairy husbandry in his own State. Besides supplying me with valuable documents on the subject, he gave me the names of several gentlemen who are familiar with dairying in all of its details, from two of whom, the Hon. G. Denniston and A. L. Fish, Esq., I have received a great deal of very valuable information, I shall quote largely from these gentlemen.

Mr. Denniston says, in relation to the value of dairy farms, the prices realized for butter and cheese, and the prices of dairy stock, that in Orange and Chemung counties, New York, a good dairy farm is worth from $50 to $80 per acre, and in Steuben from $20 to $70; that dairy cows are worth from $40 to $60 in the Spring, and from $30 to $50 in the Fall. Butter sells for from 18 to 24 cts, when packed for market, and cheese at from 8 to 10 cts. Mr. Fish says that, "land that *four* acres will summer and winter a cow, is bought and sold, with appurtenances, at from $50 to $70 per acre." With land at such prices, and with their butter and cheese at lower prices than can be realized for the same articles in Richmond, or other Virginia cities, Mr. Denniston says that, "when dairies are kept, but little farming is done—only as much corn, wheat and oats are raised as are necessary for home consumption—*the dairy being deemed more profitable than grain raising.*"

Now assuming that the attention of our farmers had been turned to dairy farming, and that the quality of our dairy products was equal to that of northern dairies, they might reasonably expect to make it more profitable than the dairymen of New York possibly can: 1st. good grazing lands can be had in all of the counties of Western Virginia, for much less than they have to pay for them in New York; 2nd. we have a good home market; in which our farmers could always realize as high a price for their butter as they do in New York, and a higher price for their cheese; and 3rd, our springs being earlier, our falls later, and our winters more mild, the cost of keeping dairy stock would necessarily be much less. In relation to this last point, Mr. Fish says, "We have to feed our dairy cows here with an equivalent to *good hay*, six, and often seven months out of the year, requiring from two to three tons to each cow."

In order that every farmer who may think of turning his attention to dairying, may be able to compare the produce of an ordinary dairy farm with what he himself produces in other crops, I subjoin extracts from the sworn statement of Mr. Halbert of Chemung county, New York, who received a premium from the New York Agricultural Society for the first quality of butter. "My farm consists of 200 acres of land, which was farmed the past season as follows. I have kept and milked 40 cows, and my grain, pasture, and meadows are as follows: 24 acres of wheat; 8 of buckwheat; 10 of oats; 20 of corn and potatoes; 2 of summer fallow; 40 of meadow; 74 of pasture, 22 of wood and waste land. Commenced making butter about the 1st of April, and up to May 4th made 512 lbs, then commenced packing for the fall market. Made in May, twenty-six days, seven hundred and forty seven lbs.; in June, 30 days, made eleven hundred and eighty-six lbs.; in July, 31 days, ten hundred and seventy-nine lbs.; in August, 31 days, ten hundred and sixteen lbs.; and from September 1st, up to December 15th, which is about the close of the season for making butter, three and a half months, nineteen hundred and forty-eight lbs. I sold my dairy, this year, for 23 cents per lb., which amount was five thousand and thirty-four lbs.; the spring butter, the butter that was sent to fairs, and the butter that was made after the dairy was taken off, amounted to fourteen hundred and fifty-four lbs.; the whole averaging 23 cents per lb., amounted in cash to fourteen hundred and ninety-two dollars and twenty-five cents. This is over and above family use—and our family will average over eight in number—which makes an average of $37 50 per cow, including heifers."

This is exclusive, too, of the pork made from the butter-milk, which is an important item of profit in every butter dairy.

In comparing the product of this farm with our farm operations, it should be borne in mind that as 114 acres, or about two-thirds of the arable land of the farm is in grass, 74 being pasture; the labor required to carry it on is necessarily much less than if it had been devoted principally to grain, and the price realized for the butter, 23 cents, was from three to five cents *less* than can always be gotten for the same quality of butter in the Richmond market, at that season of the year.

While, considering the relative advantages of dairying, and growing grain, it should be borne in mind that in raising grain, and selling the greater part of it off the land, as every grain farmer must, there is a constant drain upon the soil, whereas in making butter the drain is nothing, as every thing taken from the land in the grass, is returned in the manure. In making cheese there is more or less drain upon the land, but nothing like so much as in growing grain. Mr. Denniston says, that the farmers of New York, find dairy farming to be the very best means of restoring land, that it goes on increasing in fertility from year to year, without interruption.

Granting, however, that it is more profitable to devote the lighter and more easily worked soils of Western Virginia, to both grass and grain, or to mixed husbandry, there is still a large class of soils which could be more profitably employed for dairy purposes than for any other. First, there are many soils that are difficult to work, on account of the nearness of the underlying rock to the surface, or where the rock is constantly protruding in large masses through the soil. Such soils usually make fine pasture, and when in pasture, may be kept in good condition for an indefinite period, by simple top-dressing. If, however, they are cultivated in grain, the result is unsatisfactory; the soil is difficult to work, requires more labor than ordinary land, and the yield is necessarily very precarious. Second, we frequently meet with land well adapted to grass, but so steep as to make it difficult of cultivation; at the same time it is almost impossible to cultivate it and prevent the surface soil from being washed off. All such lands if laid down in good seed, and top-dressed occasionally with the manure from the cow-house, would be just as valuable for dairy purposes as any other.

But I am not left to mere comparisons and speculations, to show that the dairy may be made profitable with us. I have the experience of farmers in our own midst, who have tried dairying—on a small scale it is true—and yet sufficiently extensive to prove to them that it is profitable, if properly managed. Mr. Gibson of this county has a farm which he devotes exclusively to the dairy, believing that it yields him a larger return in that way than he could get from it in any other. His business arrangements are such, that he can pay but limited attention to this farm, so that it is, he says, less profitable to him than he could otherwise make it, he sells his butter at the Institute at a shilling per pound for six months of the year—the period during which the greater part of it is made—and at 20 cents the other six months, and his profits are *ten per cent on the capital invested.* This butter is equal in quality to Goshen butter, and were it packed, and sent to Richmond in winter, would sell for as high a price. Mr. Gibson keeps thirty cows, and a sufficient number of hogs to consume the buttermilk. He has a dairy woman who learned her business in Germany, and who thoroughly understands it in all its details.

The cheese dairy is not regarded as quite so profitable in New York as butter; with us it would undoubtedly be the most so. In all this region, and in the grass growing region to our West, the only cheese we get comes from the North or West, and is brought to us by the merchants, who, to make a profit on it, are obliged to sell it to us at from sixteen to twenty cents, or even more, depending upon the quality. At such prices, or any thing approaching them, the production of cheese could not be otherwise than profitable. It takes about three gallons of milk to make one pound of butter, while the same milk will, according to Mr. Fish, make three pounds of cheese. Where cheese is worth but eight or nine cents, and butter twenty-three or four, the latter, when we consider the superior value of buttermilk over whey for feeding hogs, is no doubt the most profitable; but where cheese is worth almost as much as butter, the former becomes much the most so. There can be no doubt then of the profits of the cheese dairy so long as we have so good a home market; but suppose the home market fully supplied so as to bring down the price, we still have Richmond, and other cities to send to, where the prices of cheese are always higher, by several cents, than those realized by Northern dairymen.

It appears from an estimate very kindly furnished me by Messrs. Bacon & Baskervill of Richmond, that there are about 1,000,000 lbs. of butter sold annually in that city, and 2,000,000 lbs. of cheese. Of the former about 600,000 lbs. is of northern and western production, while the whole of the latter is the produce of northern dairies. The northern butter ranges in price from twenty to twenty-eight cents, depending upon the time of the year; or the tax paid northern farmers by the city of Richmond, is not far short, of $144,000. The wholesale price of ordinary northern cheese is from ten to eleven cents, and western from nine to ten; putting the whole at ten cents, we have the sum of $200,000 as the tax paid in one of our cities for this article—this leaves out of the account all fancy brands, such as "pine-apple," "imitation English," &c., which always command a much higher price.

With such facts before us, it becomes us all to give the subject of the dairy due consideration; and especially does it become the farmers of the grass-growing region of the State, to consider whether dairy husbandry ought not to receive more attention than it has heretofore had at their hands.

In what I have said in relation to prices, profits, &c., I have assumed the production of a superior article of both butter and cheese; to make any thing else could not but result in loss instead of profit. If any of our farmers propose going into the dairy business, they must be prepared to send butter and cheese into Richmond, Petersburg, &c., of such a quality that they may compete successfully with the best northern articles, otherwise the prices realized will be two low to leave much of a margin for profits. For this purpose the butter must be well made, and well packed, so that it will keep well, and must be put up in clean, inviting looking firkins; while the cheese, after having been properly made, must be kept until it is thoroughly cured before it is sent to market.

In order to meet the wants of any farmers who may feel disposed to give the dairy a fair trial, I have obtained from Mr. Denniston a very full account of the method of making the "Orange County" butter of N. Y., which is regarded as the standard of excellence, together with complete directions for the manufacture of "New York stall cheese. He has also given me numerous directions as to pastures &c., &c., all of which will be found to be particularly valuable, not only to the dairy farmer, but to all who keep cows, and have any butter or cheese to make. These directions are in the form of two communications, in answer to numerous inquiries that I have addressed to him, they are so full and complete as to leave nothing to be desired, and I give them in Mr. Denniston's own words.

"The cellar, where the milk is kept, should be cool, well ventilated—clean. The milk ought to be strained into pans containing 10 or 12 quarts each. If the weather is very warm the pans ought to be set on the cellar bottom—otherwise on shelves. The milk ought not to be churned until it becomes thick, or loppered—the milk and cream are then churned together. Some dairymen skim off the cream and part of the milk and churn that, but Goshen butter is churned from the *milk and cream.* The churn used is the common "dasher churn," driven by dog, horse, or hand power according to the size of the dairy. The churn may be half or two-thirds full with milk; and a pail of cold water added before starting to churn. In cold weather warm water is put in. The churning should be with a slow, regular motion—and to make good solid butter will take from one hour to one hour and a half—before the churning is done, another pail of water ought to be put in. When the butter is done, take it out, wash it through one water in a large tray, throw the water out, then salt the butter, using about one ounce of pure Liverpool ("Ashton") salt to each pound of butter. Work the salt through the butter—put it in a cool place and let it stand an hour, then work it carefully over, and set it aside for five or six hours—work it over again, and set it aside in the same cool place until the next morning, when it is packed. In working butter great care ought to be taken to *work out all of the milk*—but not to work it too much, so as to break the grain, and make it "salvey." If any milk is left in, the butter will *soon become rancid,* if worked too much it will be "greasy" or "salvey," and not solid. Butter worked just enough will be *solid—sweet—yellow*—and the drops of brine on it will be *"clear as crystal."*

"Orange County butter is packed in white oak firkins—the staves selected so as not to leak the brine—the firkins will weigh about 18 or 20 lbs. empty. The firkins are soaked in pure cold water for some days before using, by being filled with the water—they hold from 80 to 100 pounds of butter. When the firkin is full, a linen cloth is placed over the top of the butter, and on this cloth a layer of salt an inch in depth is laid, made a little damp with cold water. The butter stands until marketed, then the salt and cloth are taken off—a fresh cloth wet with brine put on, and the firkin headed up. Great care should be taken to have the firkins kept perfectly clean. The outside ought to be as bright as when turned out by the cooper. No leaky firkin, or any that will filter the least particle of brine, ought to be used. This is the way Goshen butter is made."

"One of the best butter-makers in Chemung County manufactures as follows: The milk is put into 12 quart pans, and set on the bottom of the cellar where it remains until it becomes loppered. It is then, both milk and cream, poured into churns which hold a barrel each. A pail full of water to six of milk is added, and the whole brought to a temperature of 68 degrees. The churning is done by horse power, and requires two horses. Just before the butter is fully come, another pail full of water is put into each churn to thin the buttermilk, so that the butter may rise freely. The butter is taken from the churn into large wooden bowls, thoroughly washed with cold water, and salted with one ounce of Ashton (Liverpool) salt to each pound of butter, and lightly worked through with a wooden blade. It is afterwards worked at intervals of about three hours, three or four times with a common ladle, and packed into firkins the next morning."

"Butter, when packed, should be kept in as cool a place as can be found until it is sent to market—a cool cellar is the best place. Dairy butter is generally marketed in November and December. Our dairymen generally sell fresh, the butter made in spring before grass comes, and that made last in the fall after grass—they pack as long as the cows can be kept on good grass. Many feed their cows cornstalks in autumn, and continue to pack until winter."

"The proportion of pasture and of meadow land depends altogether on the season, and on the grass. Clover will not feed as long as timothy and the finer sorts. The true rule is to keep the pasture fresh by changing *from field to field*. Cows are very nice in their selection of food, they will select as cautiously as any epicure if they have a chance, and to make them profitable for dairy purposes, they *at all times* ought to have *plenty of grass and water*. In our climate we allow that two tons of hay per cow is none too much for winter, at your place less probably would answer. Corn meal is good food for cows in winter and early spring, with hay. It is very important that cows be brought through the winter in good condition, their value for dairy purposes depends on this. In our State the dairymen stable their cows through the winter, keep them warm and comfortable, and feed them well."

"In all our dairy districts, the land becomes more rich and productive from year to year. I am acquainted with acres that have not been plowed for twenty-five years; the sod is stiff and rich—the grass thick and fine. It is never fed down, except here and there in patches, the cattle selecting the finest and sweetest portions, treading the rest down into the earth to enrich the succeeding growth—thus adding to the productive capacities of the soil."

"To produce good butter, the grasses ought to be a mixture of clover, timothy, blue and other finer native grasses. We lay down our lands with clover and timothy—the white clover, the sweet vernal, and other fine grasses, come in the second or third year, making fine, sweet pasture for several years after. Where we intend to make butter, we let our land lay in sod for a number of years—the older the sod, the finer and more nourishing the grass. We prefer to restore our grass lands by top-dressing, rather than to plow and re-sod. Newly seeded lands do not produce as good grass, for dairy purposes, as old."

I would simply add, in this connection, that Mr. Gibson's dairy woman informs me, that our own blue grass, when well set, makes better butter than any other, or any mixture of grasses that she has ever seen tried.

Manufacture of Cheese.

"The manufacture of cheese consists in the complete separation of the curd from the whey, and in the proper compressing and curing of the curd. There are leading principles, relating to every stage of the manufacture, that should be noticed.

1. The evening and morning's milk are used. The evening's milk is strained into a tub, and the next morning added to the morning's milk. The temperature of the milk is then raised to from 84 to 90 degrees, by putting it into a tin vessel, which is floated in hot water. From 84 to 90 degrees is the proper temperature for the milk to be coagulated.

2. Use calf's *rennet*. This is prepared by turning out the contents of the stomach, turning the stomach inside out, hanging it up to dry, and afterwards packing it down in salt. The rennet is used by steeping a small piece in a cup of "luke-warm" water, adding a little salt. The rennet is put into the milk when the latter is at a temperature of 90 degrees, and just enough is added to make the milk coagulate. Continue to beat the milk until the curd appears distinct from the whey; this can be ascertained by pressing the surface of the milk; if the curd appears to be coagulated and solid, and the whey a pale green shade, it is a proof that the curd is in a condition to be separated from the whey, and to become fine and smooth in breaking; but if the curd

appears soft, it is not ready for breaking, and must remain until it is.

3. When ready, the curd is broken by a *cutter*, formed of wire crossing an inch apart. This is pressed through the curd, perpendicularly, in different directions, so as to separate it into small and equal parts. The finer it is broken the sooner it will separate from the whey. The time occupied in breaking the curd must be determined by circumstances. The curd must be in a condition to separate from the whey; also, to be broken even; as a general rule, the process must be continued until the curd is separated into fine and uniform parts, and appears to be tough enough to become separate from the whey.

4. As soon as the curd is settled, and the whey appears clear on the top, begin to dip the whey off, and to scald; the heat is applied faster or slower, in scalding the curd, according to the action of the rennet, as that acts rapidly or less so. The practice is to raise the temperature gradually from that of the curd, when broken up, to 90 degrees, and from that to 106 degrees. While scalding, the whey and curd are kept in motion to keep the curd from running together, and that it may be equally cooked throughout—the time varies from half to three-quarters of an hour, and sometimes longer. The test by which to know that the curd has been *cooked enough*, is, that it will feel elastic, and when chewed between the teeth will "*squeak*."

5. As soon as it is sufficiently cooked, it is separated from the whey; this is done by dropping it on a strainer spread over a tub or sink. The curd should fall in at a temperature of about 94 degrees, when it is to be salted.

6. The salt used ought to be pure Onondagua or Liverpool; one pound of salt to 40 of curd. The curd is salted when warm, say 94 degrees, and when well drained of the whey. It must be worked fine, so as to work the salt uniformly through the mass. During the salting process the temperature should fall from 94 to 75 degrees.

7. As soon as the salt is thoroughly worked in, and packed for a few minutes until the curd sinks in temperature to about 72 degrees, it should be put to press. If put to press at a higher temperature it will be tough and strong—if lower, it will crumble and not press together.

8. The press ought to vary from three to ten tons weight, according to the size of the cheese; the cheese ought not to be pressed too hard at first, as it will drive out much of its richness with the whey. Press twelve hours, then turn it and press twelve hours longer.

9. If we wish to color the cheese, we use "*annatto;*" incorporate it with the *rennet*, and apply it in setting the milk with the rennet.

10. After the cheese is taken from the press, it should be cleaned of all blotches or scum that may have risen to its surface, and sufficient oil and beeswax rubbed on to keep it from cracking. This being observed strictly, and the cheese turned over from day to day, a rind will be produced that will be impervious to flies.

11. The oil used to rub the cheese is "whey oil." The whey stands until a scum rises upon its surface, which is skimmed off and cleansed; the milk is worked from the butter, it is then tried down until all the milk and water escape, and it becomes what we call "whey oil." The cheese is turned over every day, and this oil rubbed on quite warm all over the surface, but be sure to rub no more on than will become readily incorporated with the rind.

12. After the cheese has been pressed, it is important to put around it a bandage of *thin muslin*, this is done by cutting the muslin into pieces of sufficient width to pass around the cheese, and over the edges about one inch. It is soon drawn on (by one who understands the process) with a thread and needle. This will keep the cheese from spreading and cracking.

13. It is important to watch the cheese, turn them every day and rub them to keep them free from defects, and to preserve the rind. In about three months from the making, cheese is fit for market.

To make the business profitable, the farm ought to be good for grazing, with plenty of living water on it for the cows at all times."

From Mr. Fish, I learn that "All varieties of soils that grow grass are stock soils, but our best dairy soils are what we call *uplands*, free from standing water, thoroughly impregnated with lime, yielding all the varieties of clover, timothy, red-top, &c., in the same sod, furnishing fresh food during the grazing season. No one kind of grass will be good pasture through a whole season—to seed for pasture, sow many kinds at once." He also says, that "Our best dairymen sow in drills an acre of corn to every ten cows, which is fed when in blossom, *if needed*, if not it is cut and dried for winter feed. It makes good milk for butter or cheese."

I have already referred to the fact, that a very considerable amount of butter is made in this region in the summer months, more a good deal than can be consumed at home, hence much of it must find its way to Richmond, Petersburg, &c. I learn from Messrs. Bacon & Baskervill, that about 400,000 lbs. of Virginia butter is sold in Richmond annually; a very large portion of which is "very inferior, being badly made, and much of it rancid before reaching market; the average price of which is about from 12 to 25 cents, a very small amount of nice 'mountain roll' commanding the latter price." By comparing these prices with the prices of Northern butter, we find that the latter will average at least ten cents per pound the highest. We are then, besides paying the heavy tax already referred to for 600,000 lbs. of Northern butter, in the single city of Richmond, actually losing $40,000 on the butter that goes there from our own State, and all for the want of care in the making and packing.

Let us consider for a moment how our butter gets to market; we shall then be able to understand why it is so inferior, and at the same time to suggest what will at least be a partial remedy. Taken as a whole, the butter is much better made than its condition, when sent to market, would seem to indicate; it is true that want of care in making, is one cause of its inferiority, but this is not the only, or the principal one. The greater part of all the Virginia butter that goes to market, and nearly all that is really poor, is packed at the country stores; where families give the subject sufficient attention to pack for themselves, it is an accident if the butter is not good.

Whatever butter is for sale in the family, is taken to the nearest country store; the merchant buys it in exchange for goods; if he can sell it out again from the store very well, but in certain seasons, just when the butter keeps good the shortest time, it accumulates on his hands, and he is forced to pack it. It of course has to stand some time after making before it is packed, which of itself is an injury to it, and when it is packed, very little, if any, selection is possible—good, bad and indifferent, golden yellow and milk white, sweet and strong butter, must all go in the same firkin, from which the air is never excluded from the time the butter is packed until the day it is sold. The natural effect of all this is, that before the butter can be gotten to market, frequently before it leaves the store, it is rancid, the proportion of poor butter being almost always sufficient to spoil the whole; when it is sold, the merchant, who could not afford to give a fair price for the article in the first place, is doing very well if he realizes the price originally paid; his profits, if any, are made on the goods sold, not on the butter.

Again, by the way in which butter is sold every where, except in the cities, a premium is offered for butter that is but half worked, the price is the same, no matter what the quality, and hence butter that is poorly worked, and still retains a portion of butter-milk, being heavier, actually brings the highest price.

Now the remedy that I would propose is, for the farmers, or better the farmers' wives, to see that their butter is properly made, and carefully worked—they could do no better than follow the directions for making Goshen butter—and then if the home demand is not sufficient to ensure a good price for it, let them have it packed in nice clean firkins, as it is made. The more frequently churning is done the better will the butter be, as a general thing; frequent churning prevents the possibility of the milk or cream getting "cheasey." The vessel containing the cream should always be kept cool, and well stirred every time an addition is made to its contents. Mr. Gibson's dairy-woman, whose butter I have already referred to, makes it a point to churn daily in summer; when the number of her cows will not warrant this, she keeps her cream as cool as possible, and the first thing on going into the dairy in the morning stirs it well, taking care to leave none to dry on the sides of the vessel.

In packing butter it does not matter so much about the quantity put in at once, if proper care is taken. After having been thoroughly worked, so that the drops of brine standing on it are "pure as crystal"—none other should be packed, as it cannot be kept sweet—the butter should be put in the vessel, very carefully pressed down, so as to force out all air bubbles, made smoothe on the top, and covered with a clean linen cloth, moistened with water, on which is placed a layer of about an inch of clean damp salt. When the next churning is ready for packing, let the cloth be carefully removed, so as not to spill any of the salt on the butter; pack down as before, replace the cloth, and so continue until the firkin is full. The butter should be kept as directed under the head of butter making. The firkin should be tried before it is used, to see that it is perfectly water tight. Families that do not make butter enough to pack, may keep their surplus butter fresh for a long time, by carefully working it, making it up into rolls and dropping them into strong clean brine; the brine will exclude the air, without affecting the taste of the butter in the least. This plan has been practised in my own family for years, and we have no difficulty in keeping our butter fresh as long as may be necessary. We sometimes purchase a two months' supply of fresh butter in mid-summer, and invariably find the last roll as sweet as the first.

By packing their own butter farmers would not be obliged to sacrifice it in summer, but could keep it until late in the fall or the winter, when it almost always commands a fair price even at home—a much higher price at any rate than can be gotten in summer; if, however, the quantity made during the season was sufficient to make it an object, it could all be sent to market in the nearest city, as readily as the farmer ships his wheat or flour. The merchants would soon see the necessity for making a proper discrimination in price between good and bad butter; and would find it more to their interest to pay city prices, freights, commissions, and a small profit off, for a good article of packed butter, than to pay the ordinary price for a poor article that they must pack for themselves. Then, too, those who had heretofore been careless or indifferent about the quality of their butter, finding that a good price could only be had for a good article, would soon see the necessity for giving it more attention; thus a stimulus would be given which would improve our dairy produce generally, and at the same time make it more remunerative than it ever can be, so long as the present system is practised. WILLIAM GILHAM.

V. M. I., April 1859.

Truth is the most powerful thing in the world, since fiction can only please by its resemblance of it.—*Shaftsbury.*

For the Southern Planter.

Horizontal Culture and Hill-Side Furrows---By Whom Originated?

In the April number of the "Planter" is a very interesting article by N. T. Sorsby, Esq., of Alabama, on "Horizontal Ploughing and Hill-Side Ditching." Therein is ascribed (justly I presume) to Col. T. M. Randolph, of Virginia, the honor of having introduced into this country the improved method of cultivating rolling lands. Mr. Sorsby does not state that hill-side ditches were originated by Col. Randolph, but supposes their use followed on the heels of his improvements, say about 1815 or 1816.

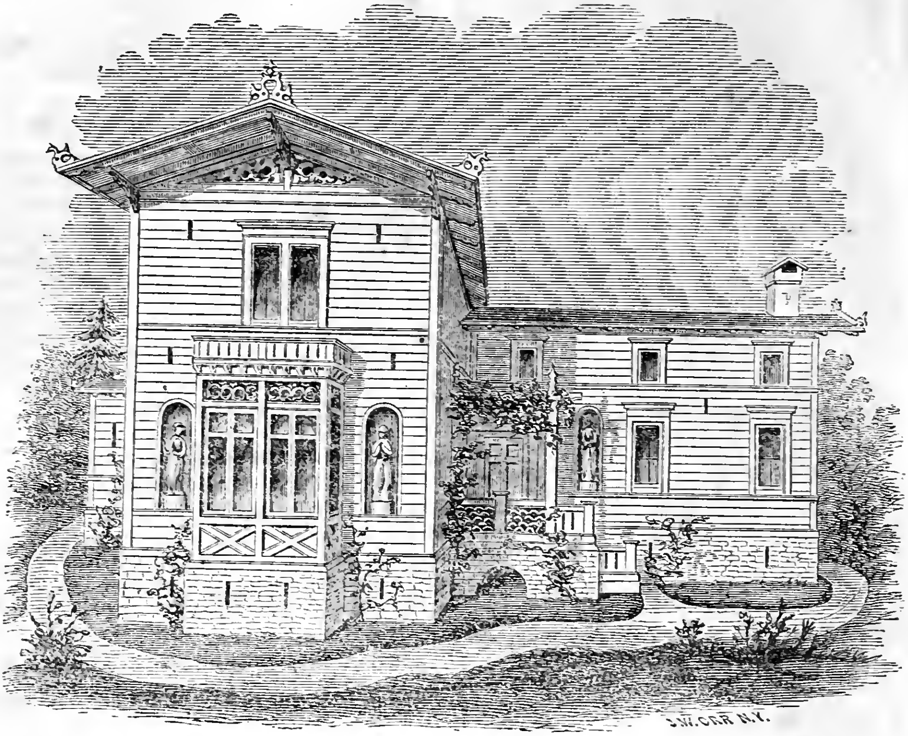
Of Col. R.'s innovation Mr. Sorsby says, "it would be gratifying to know whence he introduced it and where it originated."

In the Abbé-Raynal's History of the East and West Indies, published about 40 years earlier than the date above specified, the principle is fully developed. I cite the passage. B. 11th, p. 468 of Lond. Ed'n. of 1776.

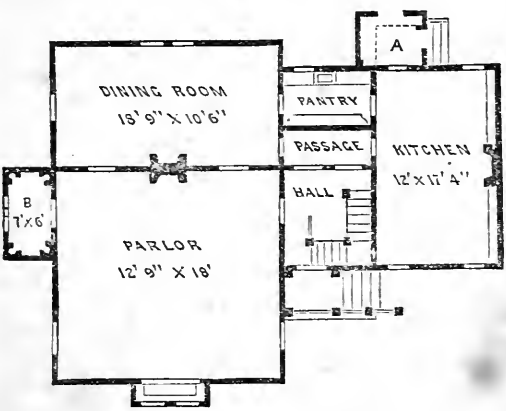
"One might prevent the danger of having shelving grounds destroyed by storms, by making furrows transversely on a line that should *cross* that of the *slope* of the hillocks. If the declivity were so steep that the cultivated grounds could be carried away, notwithstanding the furrows, small drains something deeper might be added for the same purpose at particular distances, which would partly break the force and velocity that the steepness of the hills adds to the fall of heavy rain."

The author was prescribing a remedy for the abrasion of lands in the West India Islands, which are peculiarly liable to washing rains. He does not affirm that he had ever seen the plan adopted; on the contrary, he leads us to infer that it is an original suggestion of his own, so that it still remains an open question "*whence* horizontal ploughing was *introduced?*" Be that as it may, it is clear that the idea was no new one at the time that Col. Randolph was credited with its origination. Unless he had never seen the book in question (which is improbable) the honor awarded our Virginian should rest on his just claim to have been the first to demonstrate the beneficial results of the new system to us. H.

To forgive provocation is one of the proofs of a great mind.



The New American Style of Cottages and Villas.



In attempting to introduce an American style, I have cherished the same motives that have prompted other foreign architects to the same task with their respective countries; and as we are now beginning to appreciate what is true art, and the beautiful, I have reason to believe that my efforts towards the production of an American style will not be fruitless or fail to be recognized by every lover of art. I have endeavored to conceive the exterior and interior architecture as characteristic of the manners and customs of the people, and at the same time different from all other foreign styles. The principles combined are the following:

1. The exterior architecture characteristic of the life of the occupant.
2. Characterizing by external details the different interior apartments.
3. Spirit and poesy of designs.
4. Unity and harmony of the masses, exterior details, and colors.
5. Combining every requirement of comfort.
6. Exterior and interior grandeur.
7. An equality with the interior apartments so essential to beauty; and
8. Economy in construction and simplicity in detail.

All of these principles will be found upon this miniature example which I offer as only an introduction. In relation to the principles combined, I will describe them briefly.

With the 1st—I have here shown the characteristic for a village merchant; the statues and the simplicity of the details giving it an air of liberality and love of art. 2nd. In defining this principle, which I claim as original, I will describe the characteristic for each room. In this instance, the parlor is represented by the bay window and statues, they being the richest part of the exterior. The dining-room (not seen in this view) is represented by a wide window and its details. The kitchen disguised in this instance from its situation. The entrance a distinct and interesting object in itself, the main bed-room by the wide window over parlor, and the servants' rooms by the diminutive windows. With the 3rd principle, the outline and its form are full of life and interest. With the 4th principle a uniformity with the windows and details, an equality by their situations, a bold relief and perfection of rafters of roof, and the colors used in painting. With the 5th principle, (I have here shown the owner's requirements,) entering, you have a large hall, doors to every room from hall—a beautiful staircase, hall lighted by window over front door—dining-room communication with kitchen by means of the two passages, one by the hall passage way, the other by the butler's pantry—kitchen has large fire place, sink on one side, dresser on the other, and a small wood house by kitchen door, marked A. The small room marked B is a boudoir, for the purpose of the lady of the house entertaining her morning visitors without using the parlor—on second floor are four bed-rooms, closet to each, the door of each room communicating with hall stairs, and also a linen closet and store-room in wing. With the 6th principle the position of rooms, their proportion and equality gives the appearance of grandeur. With the 7th principle, all doors and windows are in equal parts of the rooms. And lastly, with the 8th principle, economy in the construction and simplicity of all details—the wing a story and a half, the apex of roof connecting under eaves of main building—the first story is 11 feet high, second 10 feet, the second on the wing 7 feet 6 inches. In regard to ventilation, the small openings seen on the exterior are small ornamental boxes, 6 inches wide, 1 foot high, having valve shuttles and a small window on inside, both window and shutters opening by means of a cord, pulley and spring.

In winter it is perfectly tight—the situation is one foot below the interior cornice, and ornamental in appearance. This residence is built in a substantial manner, filled in with brick—roofs of tin, painted light blue—body of house a light shade of sienna, trimmings, &c., four shades darker. The effect of the whole is an air of repose and harmony, which is always interesting to behold, and I hope from this introduction I will find many friends who will give this example a just criticism—and that this example will convey a comprehensive idea of my efforts towards the production of an American style of architecture. Should any of the many readers of this journal contemplate building, I should be happy to furnish them designs and practical estimates, etc.

Respectfully,

Lawrence R. Valk,
627 Broadway, N. Y.

N. B.—The cost of construction will be $2,200, with decorations externally and internally. It can be built for $1,850 in plain style, and the same external decorations be preserved.

For the Southern Planter.

Experiments With Sombrero Guano, Etc.

Chantilly, Fairfax Co., Va.,
March 28th, 1859.

Mr. Editor:—Can you inform the readers of the Planter of the results of experiments with Sombrero Guano, also the guano from Nevassa Island, applied directly, or broadcast to the crop separately, not compounded with other fertilizers of known power and effect? My own experiment with half a ton of Sombrero, from Fowle & Co., Alexandria, Va., on corn in the hill, proved to my satisfaction that it was almost worthless; certainly less beneficial than an equal application of ashes, applied at the same time under like circumtances in all respects. Phosphatic Guano, if soluble and active, (as many cargoes of the Mexican, Colombian and African proved to be,) are to our grass growing and shift system of agriculture, surely the only guanoes which will pay, if used for a series of years; it is therefore very important that careful experiments with these Phosphatic Guanoes, should be made the present season, and made in a manner to test practically their value, to insure this, they,—whichever the party experimenting may select, must be applied alone and not compounded, as advised by those offering them for sale. After their respective merits are clearly ascertained, then any compound may be made, that may be deemed desirable. Peruvian with a soluble phosphatic guano, like the samples of Colombian used by me from Fowle & Co. in 1856–1857—in the proportions of one of Peruvian to two of Colombian, have proved in my case more valuable than any specific manure I ever used; and it is to ascertain for myself as well as the farming community, from actual experiment, the value of these guanoes, now so generally recommended by dealers, that I have been induced to make this request and these suggestions through your valuable paper.

Your obedient servant,

S. T. STUART.

Fruit Growing.

Winchester, Va., March 21st, 1859.

MESSRS. AUGUST & WILLIAMS:

Gentlemen,—Looking over my memoranda of *work* to be done in March, I find this item, ☞Remit $2 00 to Southern Planter,☜ which I take pleasure in doing, thereby securing to myself the exclusive privilege of abusing you as much as I please, if a number misses, for the next twelve months.

The articles in the Planter, upon Fruit, have been very acceptable to me, as I have leisure, occasionally, to bud, graft, and prune, and always time to consult the Planter, to ascertain how these things are to be done.

I am propagating from an apple that originated in this neighborhood—no doubt a seedling, (as it is an old field tree,) therefore better suited to our climate. This apple is a great keeper; it is no rare thing with the gentleman, who owns the original tree, to present his friends with the fruit of two seasons, that is, the apple of this and last year, together, each eatable; size of fruit, one-quarter larger than Newtown pippins; color, pale yellow; flesh white, brittle and juicy; tree constant and prolific bearer. I have a small orchard, which, with care and *no grazing*, will come into bearing in a year or two, consisting principally of this fruit. I am convinced our native apple is better than those from the North. I once obtained a few of the celebrated keeper, the Ribston pippin, (English,) and they proved to be a Fall apple with me; and from what I see of the Baldwin, Rhode Island Greening, and Northern Spy, they will not make a keeper with us. Now, sirs, if you could christen my apple with some *highfalutin* name, I might induce *amateur* fruitists (of responsibility) to exchange a few cuttings with me.

Yours respect.,

H. M. BAKER.

We take the liberty of publishing the letter of our friend, that it may meet the eyes of those of our subscribers who are engaged in fruit growing.

Messrs. Davis, Sinton, Guest, Robey, Taylor, and Tudor, all have nurseries, and understand the business thoroughly. To them we refer our friend for any information he may need in their line.

Our correspondent's item of "Work for the Month," has never been before published. We like it greatly, and cordially recommend it to the attention of our subscribers, who we hope will not fail to make a similar entry in their note books, *and act upon it accordingly*. We are strongly inclined to ask our neighbors, the industrious and hard-working Editors of our "exchanges," when they make up their list of of items of "Work for the Month," not to fail to insert so valuable a hint as "Remit $2 00 to Southern Planter."

Ornamental Gardening.

THE ANEMONE.

The anemone has long shared the attention of the florist, and, in his arrangements, has generally been associated with the ranunculus, resembling the latter in its natural habits and requisites of culture. The single and semi-double flowers are considered nearly as fine as the double ones. The sorts are numerous; but, at present, are seldom distinguished by names. In a fine double anemone, the stem should be strong, erect, and not less than nine inches high.—The flower should be at least two and a half inches in diameter, consisting of an exterior row of large, well-rounded petals, in the form of a broad, shallow cup, the interior part of which should contain a number of small petals, mixed with stamens, imbricating each other. The colors should be clear and distinct when diversified in the same flower, or striking and brilliant when there is only one tint.

Of late years, anemones remarkable for the magnitude of their flowers and the brilliancy of their hues have been added to the list, and make a most attractive appearance. The plant continues long in flower, and the leaves often remain so long green, that it is difficult to find a period of inaction in which to take up the roots. It has been recommended that, as soon as the bloom is over, the bed should be screened from rain, by mattings, until the leaves wither. As the tuberous roots are rather brittle, they require considerable care in handling. A bed of single anemones, it may be remarked, is a valuable addition to a flower-garden, as it affords, in a warm situation, an abundance of handsome and, often, brilliant flowers.

GENERAL CARE OF FLOWERS AT THIS SEASON.

At the present time, the whole collection of flower-plants should be looked over, and wherever there is a deficiency of stock, a fresh supply should be brought on. Seeds of various plants should be sown—rare and choice ones re-potted. Camelias will now be nearly out of bloom, and will soon begin to grow; syringe them well every fair day, and keep them moist at the roots; prune all straggling plants into shape, and perform the operation of inarching. Pelargoniums will be growing rapidly, and some of the earliest showing bloom; water rather more liberally, and tie out the shoots as they advance in growth. Roses in small pots should be shifted into larger sizes, and cuttings put in for a young stock. Japan lilies, which have attained a good growth, may now be changed into larger pots. Fuchias will now begin to grow, and should be shaken out of the old soil, and re-potted in fresh, rich compost. Azalias should now be freely watered, and young plants in small pots may be shifted into larger size. Heaths require to be kept as cool as possible, and their shoots should be often topped. Cactuses will now begin to grow, and should have a rather more liberal supply of water. Petunias, verbenas, heliotropes, salvias, and all the various fine-bedding plants, should now be propagated from cuttings, if the stock is not sufficient.

CAMELLIA JAPONICAS.

The camellia Japonica, or Japan lily, is one of the most beautiful of evergreens for the greenhouse or conservatory. It propagates freely by cuttings, the single-flowering kinds being increased in this way, to be used as stocks, on which the finer varieties are multiplied by grafting, budding, or inarching. Cuttings of the last year's wood should be taken about three inches long, cut below a joint, the lower leaf removed, and then planted firmly in pots of sandy loam. Pot them, when rooted, singly into the smallest-sized pots, and keep them in a frame. In this they are kept, being re-potted as they require it, until they are wanted as stocks. The choice varieties are better for growing without much artificial heat.

After they have done flowering, they should be kept in the greenhouse, or some other suitable situation, until they have made their growth—when a sheltered, outdoor situation, free alike from sun or covering, and, with plenty of air, will suit them best. They like plenty of air at all times; but, while growing, it is necessary to keep them from draughts of cold or drying air, which cause them to curl and become stunted, spoiling all the beauty of the new growth.

Grafting, budding, and inarching should be done just before the buds start on the sort to be multiplied, and just as the stock begins its growth. The proper soil is two-thirds loam, one-sixth turfy peat, and one-sixth decomposed manure; these should lie together for some time, out of the reach of heavy rains, and should be thoroughly mixed. They are readily raised from seed, if the seeds are put in as soon as ripe, and placed in the greenhouse. When the seedlings have advanced one season, and the first year's wood is ripened, the bloom may be very much hastened by inarching the top upon a strong stock; but this is only worth doing in the case of such as indicate novelty. The plants require always to be kept very clean.

FLOWER-GARDEN SOILS.

The operation of digging is the most efficient method of moving the soil of a flower-garden. Although tiresome, as well as disagreeable to an inexperienced person, a little practice makes it comparatively easy, so that in a moderate degree it may be done with facility, even by a lady. The spade used for this purpose ought to be light, for convenience of handling—bright in the blade, for parting readily from the soil—and sharp at the cutting edge, that it may need less force to press it into the ground. In the same way as in trenching, an opening, or furrow, must first be taken out at the end where the work is to commence, and the earth to be carried to the end, where it is to finish, ready for filling up the last furrow. A second furrow or trench should then be dug in a line with the first, dropping each spadeful of earth in a reversed position into the open trench, and taking care to bury the manure properly, if any is used. By proceeding thus in a regular manner, from right to left, and then back again from left to right, the whole piece will, when finished, present a level surface. In digging for immediate planting or sowing, pains must be taken to break the lumps, and reduce the soil to what is called a fine tilth. All stones should, of course, be carefully removed, as well as all other undesirable substances, and this can only be thoroughly done when the soil has been well pulverized.

TRANSPLANTING EVERGREEN SHRUBS.

All shrubs, and especially large ones, should have an ample supply of water when they are transplanted; and this is most effectively given when the water is run into the new pit or hole in which the plant is placed, along with the filling in of the earth, beginning when the hole is about one-fourth filled, and continuing till it is nearly quite full. The quantity of water should be such as to form a strong puddle round the ball; this mode of watering keeps the roots moist, as well as consolidates the earth about them, and if carefully done at first, will scarcely require any addition. If the water is not administered till after the earth has been fully pressed in round the roots, frequent repetition and larger quantities will be necessary.

There has been much difference of opinion, and many discussions respecting the most suitable season for transplanting evergreen shrubs. Some recommend the autumn months, and others prefer the spring, carefully avoiding, at either period, frosty and withering weather. It is admitted by all, that the transplanting of evergreens should not be attempted when the plants are in full growth; for though even they survive the shock, the chance is that many of them will perish or die down to the ground. It seems also ascertained, that the loss of evergreens when transplanted is caused by the excess of perspiration from their leaves, compared with the quantity of sap taken up by their mutilated roots; and that, consequently, dry, parching weather, at whatever season it occurs, is, other things being equal, a most unpropitious time for the operations of transplanting.

SEEDLING ROSES.

To hasten the blooming of seedling roses, the seedlings should, when they come up in May, be kept well moistened, but not too wet, until they can be well taken hold of, in order to pot off. Put one each into the smallest-sized pots, and let them, as soon as they are established, be placed in the shade, out of doors, but the greatest care must be taken to prevent the attack of the fly, or vermin of any kind. They must be looked at daily, and upon the least appearance of fly, the plants must be placed under cover, and fumigated and syringed regularly. It is still better, if there is frame room, to put them in when potted, because it gives an opportunity of shading, of keeping off too much wet, protecting them against wind, and of fumigating without the least difficulty, when necessary. They should, however, seldom have the glasses on. After they have been five or six weeks in these pots, they may be bedded out in rich beds of loam and manure, without disturbing the balls; they may be planted about a foot apart, in beds four feet wide. Before the close of the budding season, many will have grown quite large enough to breed from, and the most promising may be cut back, and three or four buds put on remarkably strong stocks. Select a strong branch for budding on, and, at first, let some portion of the branch beyond the bud be left on to grow; a very small shoot beyond the bud will do to draw the sap past the bud. These buds will strike off vigorously the next season, and make considerable growth; but before the bud has shot far, cut the stock away everywhere but the portions budded on. The growth they will make this summer on strong stocks will insure their blooming the next season.

New York Mercury.

The Southern Planter.

RICHMOND, VIRGINIA.

Guano.

Since the introduction of this fertilizer into the United States, we are inclined to believe that a majority of our farmers have paid less attention than formerly, to making and husbanding putrescent manures. In relying upon it entirely, as the means of making a crop, we are satisfied that all who have done so, have committed an error which they have probably by this time regretted. "Bought wisdom is best," and there are doubtless many agriculturists who are largely out of pocket, for the information they possess on the subject of Guano, while they are inclined strongly to suspect that in this case they may have paid rather too dearly for their "whistle." This is a true picture of our own case, at all events. We have for several years past been afraid of Guano, for the same reason that "a burnt child dreads the fire."

From having often witnessed the almost magical effects of guano, applied to poor and sandy soils, we supposed that the use of 200 lbs. per acre, amounted to an insurance against loss in a wheat crop, while the land would be left certainly improved. But having acted on this belief, we lost our crop of wheat (in part) in consequence of "scab," and the ravages of "chinch bug," and were compelled to give up our theory, and change our practice for one more economical. We have not abandoned the use of guano entirely, nor have we relied upon it wholly as a manure, except for potatoes. We find it a valuable adjunct to the ordinary manures of the farm, which may be made richer in ammonia and inorganic constituents, by the addition of a little guano and plaster combined. When we have used it for this purpose, the mode of application was to sow it lightly over the manure heap, on a wet and "drizzly day." We are satisfied that various and very different results attend the use of guano, depending not only on the modes of application, but on the soils themselves. For instance, we have seen the most profitable results of its use, on *red clay* soil. Next to this, on warm and sandy lands, while upon "grey clays," we have rarely seen *any* improvement of the land after the crop was gathered, and very often the crop itself has not been sufficiently augmented in quantity, to justify any outlay for guano.

We give our readers some of our own *opinions, merely*, about guano, which we beg may be understood as such only, and not on our part stated as positive facts. 1st. Guano should be used sparingly, until its effects upon, or rather adaptability to the soil, may be sufficiently apparent to free its use from any of the risk, so often attending upon "guess work." Will it pay? should be a question to which every farmer ought to have a satisfactory reply before venturing on any experiments with high priced fertilizers at any time; but greater than usual caution seems to be required now, since field crops have suffered so many unusual disasters, within the past four years, from accidents and enemies, hitherto not very common. 2nd. "Elide Island Guano" is as good as "Peruvian;" in fact, from what we have seen and heard of its effects, we think about it, as the Irishman did of men when being asked "if one man was not as good as another?" he replied, "Indade, I think so, and a great dale betther." The crops of wheat in this vicinity, where this guano was used last fall, are unusually promising at the present time. Some allowance must, of course, be made for the wet season, which has been favorable for the full development of the effects of every kind of guano. We have, however, heard it so highly praised by persons who have used it, that we do not rely upon the present appearance of the wheat crop, in forming our opinion of its excellence. 3rd. "Ducked Guano," which is usually sold by dealers at a low price in consequence of its condition as "damaged," we do not believe is at all injured—if it has been "ducked" in salt water especially. The best crops of wheat and corn we have known to be raised on two particular farms in Henrico, have been produced by the use of "ducked guano," combined with a quantity of plaster sufficient to render the guano dry enough for sowing. 4th. The application of guano, to crops of almost every kind, at the time of sowing, is cheaper and more efficacious when a drill is used in preference to the old way of sowing it broad-cast. 5th. Guano mixed with dry ashes, is much improved in value by the combination, although scientifically the two are held to be chemically incompatible. If *any* water is added at the time of mixing, the escape of the ammonia is rapid and injurious; hence both the ashes and guano should be perfectly dry at the time of mixing, and the sooner the compound is plowed under, the better. We have seen this experiment tried, with beneficial results, both as to the crop and the land.

If the experience of any of our friends does not agree with these notions of ours, we should be happy to hear from them, and to know wherein we have erred.

We also invite attention to Mr. Stuart's communication, (to be found in our present number,) and solicit reports of the results of any experiments which may have been made by any of our readers, with Sombrero, Nevassa and Colombian, guanos uncombined with others. We have had no experience with them. Of the different varieties of "Manipulated," now offered in market, we suppose the greatest difference between them to consist in the different names of the manufacturers, viz: Kettlewell, Reese, and Robinson, as they all claim to contain 8 per cent of ammonia, with from 45 to 50 per cent of Phosphate of Lime. Nor do we doubt that they are in their composition all that these gentlemen represent them to be. We intend to use this spring "Manipulated Guano" on our tobacco crop. We have not had experience enough with these Guanos to justify us in complimenting them as highly as we have heard some farmers do, in whose judgment we had full confidence, but we can say with the utmost propriety, that these guanos are so thoroughly prepared by machinery, as to save a deal of trouble in "sifting" and breaking lumps. They are sent to market in admirable order for farmers' use.

A new variety is just introduced to notice, called the "American Guano." The published analysis of it is very unsatisfactory, as the per centage of *Sulphate and Phosphate of Lime* is given in such a way as to leave every one in the dark, as to the relative quantities of the two articles. We should prefer to know the exact proportion of the Phosphate of Lime included in the stated per centage of 71 to 72.50.

Plaster is easily procured, and at a much cheaper rate than it can be bought for in any kind of guano, however largely it may figure as a constituent element thereof. We understand that analyses have been made by Dr. Maupin, of the University of Virginia, and by Major Gilham, of the Virginia Military Institute. *Why are they not published!* The high authority of these names would greatly promote the sale of the article if reported of favorably by them. Unless they are published we shall be governed by the legitimate inference from that fact, and abstain from its use, and from recommending it to our friends.

The Valley of the Rappahannock.

We find in the April number of *De Bow's Review*, an interesting and well-written article, from the pen of our old friend and neighbour, George Fitzhugh, Esq., describing the principal points of interest along the Rappahannock. To those of our readers who can procure the "Review," we commend Mr. F.'s articles as a means of becoming acquainted with one of the most charming sections of the State.

We enjoyed a pleasant home for years, in the midst of the neighbourhood of which Mr. F. writes in the April number at a period of our life, when all its objects seemed "couleur de rose."

We thought then, as we think now—

"There is not in this wide world
A valley so sweet."

Nature has been very liberal in her bounty to this valley. The most beautiful scenery everywhere meets the eye: the soil is quick and warm—admirably adapted to both farming and gardening purposes, while it always gives a generous return for liberal treatment. The river not only furnishes a ready means of conveying to market the large crops of grain grown on its banks, and fish, oysters, and wild fowl of all sorts as luxuries for the table, but adds an ever-present beauty to the landscape. We had almost said, "a living can be had for the asking," throughout the "Valley;" but it can be had *without* the asking. Hospitality, the most liberal, kind, and genial, meets every visitor. He may be sure of a hearty welcome, and good cheer, go where he may within its borders, and it is his own fault if he does not feel at home.

While we know very well what *Nature* has done for our agricultural friends in that section, we are sorry that we do not know what they are *doing for themselves*. They have facilities for going ahead of most farmers. The land is easily cultivated. Marl of good quality abounds; lime can be easily procured at a cheap rate, while all the crops grown in the State can be raised in remunerating quantities per acre.

Will some of our old friends occasionally let us know, at least, that they are not "lagging behind" in the race of improvement, while they possess so many and so great natural advantages for progress?

A New Book.

THESAURUS MUSICUS; *Or, the United States Collection of Church Music, containing the most complete variety of the New Psalm and Hymn Tunes, Sentences, Anthems, Chants, &c.*, for the use of the Choir, the Congregation, and the Singing-school, ever offered to the American people; Comprising, also, all the popular old Choir and Congregational Tunes in general use. By L. C. & Dr. A. B. Everett, Richmond, Virginia.

Such are the title and pretensions of a new work on church psalmody which has been laid on our table by Mr. J. W. Randolph, of this city. We confess to entire ignorance of the *science* of music, but we are not insensible to the pleasures of natural taste, when excited by good performances, whether vocal or instrumental. With the above avowal, our recommendation would avail but little, but seeing that its place of publication is *Richmond*, our "Southern feeling" was enlisted in its favour; we therefore consulted with some of our friends, on whose opinions and judgment we could rely—and feel happy to add, that they think the work is entitled to the merit claimed for it. We feel safe, then, in recommending it to our readers.

"Onions, and How to Raise Them."

We return our thanks to Orange B. Judd, Esq., the accomplished Editor of "*The American Agriculturist*," for a copy of the Pamphlet on this subject, which he has recently published. It contains full instructions as to the best mode of raising the onion, furnished by *seventeen* practical growers of the crop.

American Veterinary Journal.

We are very sorry to learn, from the annexed circular, that we are to loose the "American Veterinary Journal" from our exchange list, for even a short time. It deserves to be well kept, so as to be able to "go along" whenever called on.

Dr. Dadd has been industrious and useful, in disseminating knowledge of the veterinary art. We believe his Journal was the only one in the United States devoted to the scientific treatment of the diseases of horses and other domestic animals, and we hoped it might be the means of exploding many errors in the popular veterinary practice, as well as improve the condition and treatment of horses. We hope to see the Journal soon "enlarged and improved," and with a long list of paying subscribers. We will forward subscriptions for any of our friends free of charge.

"BOSTON, March 26, 1859.

"DEAR SIR:

"I take the liberty to inform you, that the publication of the 'AMERICAN VETERINARY JOURNAL' is suspended, with the March issue. The only explanation I have to offer is, that in consequence of remissness on the part of subscribers for the past two years, my pocket-book is now the seat of a very severe attack of dyspepsia, which threatens to confine me and my family to a diet of shorts.

"With many thanks for the favours bestowed on me through the pages of your valuable paper,

"I subscribe myself,
" Very Respectfully Yours.
"GEO. H. DADD."

Deep Sea Telegraph.

A friend has sent us a letter of our distinguished countryman, Lieut. M. F. Maury, (read before the Royal Dublin Society, Jan. 28th, 1859,) on the difficulties to be overcome in successfully laying the "Deep Sea Telegraph Line." We have been much interested in its perusal, and return our thanks for the pamphlet containing it.

Lieut. Maury entertains no doubt of the ultimate success of a telegraph across the Atlantic.

Our Agents.

The following gentlemen have kindly consented to act as our agents, who are authorized to give receipts in our names for payments due the "SOUTHERN PLANTER," by either old or new subscribers:

JNO. W. BURKE, Alexandria, Va.
MAJOR P. WILLIAMS, Washington City, D. C.
WM. F. CATLETT, Guiney's Depot, Va.
TURNER & ACREE, Walkerton, K. & Q., Va.
JOHN T. CHILDREY, Henrico.
JAMES N. GOLDSBOROUGH, Easton, Md.
GEO. C. REID, Norfolk.
BENJ. F. GRESHAM, Newtown, K. & Q., Va.
F. N. WATKINS, (at the Farmers' Bank,) Farmville, Va.
SAMUEL SANDS, Esq., Baltimore, Maryland.

University of Virginia.

This noble Institution—the pride and "crowning glory of Virginia"—which has outstripped even the power of imagination in its glorious career of progress and usefulness, finds itself (as we learn) under the imperative necessity—with some six hundred and thirty or forty matriculates now crowding its halls—of enlarging its accommodations for the reception of at least fifty additional students.

We enjoyed the gratification, last summer, of attending some of the commencement exercises of the Institution, and were gratified beyond our limited power of expression, with the matured fruits of high intellectual training and cultivation exhibited in the various performances of the young men, which it was our privilege to witness on the occasion.

All honor to the Great Masters, whose plastic hands are thus modeling the youth of the State on the high standard of moral and mental qualification, of which the Faculty themselves, we are proud to say, do constitute so eminent a type.

We have before us the fine address of Professor Venable, of Columbia College, S. C., delivered before his confreres of the Society of the Alumni, on the occasion above referred to. We could wish a copy of it were in the hands of every reading man in Virginia. We close this notice with a few extracts from it, which we endorse with unqualified approbation, and commend to our readers as worthy of their attentive consideration.

"Who can doubt that the loyalty of patriotism is heightened by the bestowal, on the part of the State, of the means of satisfying the highest and noblest aspirations of its sons? Who can doubt that a prosperous National University, under the control of the Federal authorities, and thronged by youths from all quarters of the Union, would be a most powerful and even dangerous element of centralization in a government constituted like our own? Or that a great State University, combining the qualifications which we have given, would accomplish more than any other means to preserve the spirit of loyalty to the State, its honour, its sovereignty and its institutions? Yes, though every spot of earth from the mountains to the seaboard may be sacred soil to our love for our dear old mother, is not that love strengthened, heightened, purified, when we think of this her noble creation to which her sons can come and receive the liberal gifts of learning at her hands.

"A comparison of our alma mater with the systems of which we have spoken, we leave to others to make. Says a distinguished and impartial traveller, Von Raumer, 'The University of Virginia would readily admit of such further improvements as the present age demands.' A modest compliment apparently, but still one which can be applied to very few of the great schools of the United States. Yes, it is a noble foundation on which to build a great cis-Atlantic University, second to none on either continent. The vigour of its intellectual life, the zeal for learning which it has spread among the youth of the State, its high standard of attainment, giving rank to its professional schools and to the training of its academic schools somewhat of that special professional character appopriate to University education, are all harbingers of a great future. The nucleus of endowed Professorships is here, around which it will not be difficult to gather in some form or other, young and vigorous talent, ambitious of distinction in the walks of philosophy and literature, and we see foreshadowed in this great institution, the crowning glory of Virginia—a greater still—the crowning glory of the South.

"In view of all these things, when so potent an intellectual sceptre seems to be within the grasp of your State, so fitted to bear it by her central position, glorious antecedents, and conservative character, the heart of every patriotic son of the Old Dominion is sad and indignant to know that, in her legislative halls the rights of her youth are disregarded, their hopes and aspirations flouted as mere dreams of the fancy, and this corporation, which has accomplished more for her glory and power than all others within its limits, refused the pittance needed partially to supply the necessities, which even her prosperity has entailed upon her. Gentlemen of the Society of Alumni, it is our duty to throw down the gauntlet to the rampant demagogueism which would stint and starve this noble foundation—would even with the cry of the people—the pretence of educating the people, strike a blow at the most important interest of the Commonwealth. Educate the people! Is not your University the great educator of the people? Whom must we thank for the reformation of the Colleges of the people and their elevation to a higher standard of attainment and greater usefulness? for the schools which have sprung up throughout your borders, shedding their benign influences upon every class of the people? Where must we look for the source of that energy which characterizes all the educational movements of your State, but to this great central heart, sending its warm and healthful life-blood through all the ramifications of your educational system, incongruous as that system is. And cannot the humblest son of the people come up hither where no aristocracy is acknowledged, but that of talent and virtue, and carve out for himself a career of honour and usefulness?

"Let the people be educated, we will all say—and we will fervently wish that some of our statesmen would imitate the great men of other times and nations, and devote themselves to a thorough study of the subject of primary education and the best mode of performing the duty of the State in that regard.

"But away with that mockery of principle which would make it any less the duty of the State to bestow that higher special instruction on her sons, which is to provide the people with well trained public servants; which affords to the magistrates, lawyers, legislators, physicians and teachers of the people, the opportunity of thorough studies in all the subjects relating to their professions; and in the words of Guizot, 'which developes those men of superior genius who extend the domain of intelligence; unveil the secrets of Nature; find in ancient monuments the traces of past events; found upon the observation of man, the art so difficult of governing him; and increase the glory and power of their country by bequeathing to it their labours and their name.' If primary instruction of the people is essential to the stability of our government, it is equally essential to its well-being and permanent prosperity, that the higher education be promoted. And in our present position before the world, a high scientific and literary cultivation is an imperative national necessity. It accomplishes little to defend our institutions and boast of them before the world. By their fruits let them be known.

"Nearly ten years have passed away since, at one of these anniversaries, I listened, while a distinguished Alumnus traced in a glowing and eloquent picture, the resemblance of our social organization to that of the nation of antiquity, whose intellectual supremacy all centuries acknowledge—and I saw Virginia, the goddess of my youthful adoration, equipped for the contest, as she stood with her foot upon the chariot ready to enter upon the course of emulation with the past. Since that time brilliant gems have been added to this, the brightest setting in her crown; noble additions have been made to our own alma mater. The tide of her prosperity has rolled on with an ever increasing flood. Even that short period must be a gratifying retrospect for us all. But how much more grateful the prospect, when, properly cherished by the State, not content or complacent with the contemplation of the sister institutions which she has outstripped, but aiming at the high mark of the most perfect systems of instruction which the exemplars of the past or models of the present afford us, she shall take high rank among the Universities of the world." * * * *

"Where will Virginia stand in this great national literature? Will she not be up and doing? Will she not make many glorious additions to the tower of learning and science, which, based upon eternal truth, obtains its fair proportions from all the realms of Nature and of thought? Let her then ever cherish here her youth in lofty cultivation, in thorough studies, in the admiration of the beautiful and great in the actions, the writings, and discoveries of man, of the sublime in the creation of God. Long may the sons of the Republic gather hither to worship in this temple of science and virtue, on whose portals let it ever be inscribed—*Deum timeto; patriam amato; virtutem colito; disciplinis bonis operam dato.*"

A fine coat may cover a fool, but never conceal one.

Nottoway-Club.

We are indebted to the Secretary of the model Agricultural Club of Nottoway, for the following valuable reports, which we hasten to lay before our readers. If all the Clubs scattered through the State, were to pursue the course of the one now under consideration, the Planter would become the medium of communicating to the farming public such a mass of valuable practical information, as would raise it at once to the dignity of a household necessity—a position to the attainment of which through our own unaided efforts, we dare not aspire.

Report on Rotation of Crops, by William Irby, Esq.

Mr. President:

An extended interval of time between hoe crops in connection with a judicious rotation of crops, including a more enlarged cultivation of clover and grass, is our only sure and practicable plan for the recuperation of our worn-out soil, and our only hope for a permanent and progressive state of improvement; as the neglect of attending to these important truths is the main cause of the impoverished condition of our country, so a strict attention to them, is our only remedy. I do not by any means intend to dissuade from a strict attention to the accumulation of domestic manures, and the use of foreign fertilizers; but I do wish to state, emphatically, that with the use of all these, though large crops may, for a time, be made, yet if hoe crops succeed each other at short intervals, and no regard be paid to rotation, it must prove a deteriorating system. We must, under a judicious system, depend on the native recuperative powers of our soil; for even if we had large quantities of our poor farm-pen manures and vegetable matter, we could not afford to haul them the distance we would often have to do, in order to apply them where they are needed. These thoughts are not of course intended to be applied to farms near cities, where rich stable manure may be obtained, but our section of country, where lime and plaster are inefficient, and where the farms are necessarily thrown on their own native resources for improvement.

In the early, and even down to a recent period of our history, the only system was to clear the forest, cultivate tobacco as long as the land would grow it, then a wheat patch, (according to the old idiom,) then corn and oats, as long as the land would produce them,—and then stern necessity required that it should be thrown out as commons, with little or no hope that it would ever recover. But thanks to the despised old field pine, to which a large debt of gratitude is still due, for it sprung up spontaneously on land so exhausted, that neither corn nor oats, nor even grass suitable for cattle could grow; and by its long tap roots raised from the subsoil, and by its falling leaves, restored to the exhausted surface, those inorganic ingredients so necessary to profitable crops. Not only so, it affords vegetable matter for humus and shade, which, according to Baldwin, is the only thing necessary for making poor land rich. To this necessitated rotation, (viz: the old field pine,) I do not hesitate to say, we have derived more benefit than we have (up to this time) from the combined results of lime, plaster and clover. But this rotation, however beneficial it has been, is not now practicable, for we have not the virgin soil to clear, while the exhausted land is lying out in pine for forty or fifty years; nor, indeed, is this rotation desirable. The philosophy of a rotation of crops is based on the fact that while all plants live mostly on the atmosphere, yet all require inorganic or mineral ingredients, which they can obtain from the soil only. Some classes of plants derive more of their sustenance from the atmosphere than others, and some take up more of one or more of the mineral ingredients of the soil than others. A judicious system requires that dissimilar plants in the above respects, should follow each other.

Secondly It is known that particular species of destructive insects prey on particular plants. In order to prevent their increase, a change of plants is necessary.

Thirdly. Regard should be had to a suitable preparation of the soil by one crop for the subsequent one. But a long interval between hoe crops, giving time for the grasses to form a sod, thereby preventing the washing off of the soil, by which our lands have been more injured than by all other causes, is perhaps more important than any, or even than all of the above considerations.

When the forest land became scarce, and it became painfully evident that the constant cultivation of the land was ruinous, our fathers adopted the three-field system. This, in connection with nongrazing, was confidently expected to reclaim our wasted fields. It is true it had its ameliorating effects in comparison with the former scourging system, but it is not believed that the land, in our section of country at least, could ever have attained a high state of improvement under this system. So far from it, it is evident to every careful observer, that after going up to a certain state of improvement it gradually declined. Rather than adopt this system, I would prefer cultivating portions of the flat land on the farm two years in succession in hoe crops, and let the poorer portions of the upland be cultivated only once in four years.

Since discarding the three-field system, the four, five, and six-field sytems have all had their advocates. In making a selection of a system, the farmer should be guided by the quantity of arable land he has in proportion to his force, and the particular crop he designs as his money or staple crop. The one who intends making large crops of tobacco, and who, of course, will have no time to fallow for wheat, the four-field system is probably the best. The one who intends discarding the tobacco crop entirely, or greatly diminishing it, and making the wheat crop his money crop, should adopt the six-field system. The one who intends to decrease the tobacco crop, and to increase the wheat crop by fallowing, may adopt the five-field system; but if he has sufficient open land, the six-field system is to be preferred, as both the four and six-field systems are more ameliorating than the five-field.

When wheat was high and guano low, I adopted this variation of the five-field system, with which I was pleased,—viz: I grew wheat after tobacco on all my tobacco land, and on the best of my corn land; on the balance of the corn land I sowed oats, instead of permitting the field to remain idle. The third year I fallowed both wheat and oat land, and put the whole field in wheat. The advantages of this variation are, that the ditches which had been cleaned out for corn or tobacco, will not need cleaning out again during the rotation; and secondly, the grubbing and plowing are much lighter than when the land remains idle for a whole year; and lastly, the certainty of securing a fallow is greatly enhanced, as there is less dependence on rains to soften the ground. All who have attempted making tobacco and fallowing for wheat, have found fallowing both difficult and uncertain, owing to the frequent droughts in August, and the short period that can be devoted to that operation. I have found clover, &c., to succeed pretty well on this system.

Although comparatively few will advocate a system by which the soil is annually impoverished, yet many are guilty of the practice. Tillers of the soil are perhaps more inclined to follow the beaten track, and less inclined to change than persons of any other avocation. Moreover, a change of system is frequently attended with loss, and always with trouble. I am ready to admit that for a long time after I saw the necessity of a change, I was deterred by these considerations. I will now state (I hope without being charged with egotism) for the encouragement of those who are halting, that I found the difficulties in a change of system less than I anticipated, and I do not know that I can put anything down on the score of loss.

Though the immediate improvement resulting from the adoption of a more ameliorating system, is at first scarcely perceptible, yet those who have adopted such a one, have the consolation of knowing that they have made the first and most difficult step, and should be encouraged to persevere, as its good effects are accumulative, for the more they improve, the more easily they may improve. They are also relieved from the unpleasant reflection, that after deducting the many annual necessary items of farm expenses from the gross proceeds, in order to ascertain the net profit, this ugly item has not to be added to the list,—viz: minus from amount invested in land on account of decreased value thereof.

We cannot for a moment suppose that the All-Wise so constituted the earth that man would have to exhaust the soil in order to obtain food from it. For our first parents, (and we in them,) were commanded "to replenish the earth," as well as "to subdue it." There is no doubt but what there is a system of so cultivating the earth, that both man and beast shall have ample sustenance, and it at the same time become capable of supporting a larger and larger population. Having in view these principles, the truth of which all must admit, it appears worse than unreasonable that any one should pursue a plan which he knows must reduce to sterility that portion of the earth entrusted to him. But the pursuing of a judicious system not only relieves one from these unpleasant thoughts, but brings about the pleasant reflection that such a course is in accordance with the designs of the Creator, and that this earth is physically, at least, if in no other way, made better by his having lived on it.

Respectfully submitted,

WM. IRBY.

Report of Experiments with Peruvian and Manipulated Guano, by WM. R. BLAND, ESQ.

To the Farmers' Club of Nottoway:

In compliance with the standing rule of our club, requiring each member to report, in writing, the result of some operation on the farm during the year, or an essay in writing, I regret that, from causes over which I had no control, I am unable to make any report which will tend to establish the correctness of any procedure in agriculture, or the relative value of either of the special manures with which I experimented during the last year; but I will report as far as observed, the results of those different experiments begun, with the intention of reporting them to the club.

1st. On both of my farms, I begun an experiment to test the relative value of Peruvian Guano and the Manipulated Guano, (a mixture of Peruvian and Phospatic Guano,) in the cultivation of tobacco. I used on a strip of land running through the whole length of a piece of pine land new ground, Peruvian Guano at the rate of 150 pounds to the acre, and on each side thereof, the Manipulated Guano at about the same cost per acre. Up to about the middle of July, the experiment on the farm on which I live, seemed to be decidedly in favor of the Manipulated Guano, the leaf and stalk of the tobacco were larger, broader and of a deeper green, and were observed by, I believe, every person who saw that tobacco. At that time the severe drought of the past summer set in, and the tobacco made no farther growth, so I concluded that the farther prosecution of the experiment by ascertaining the relative products in weight, of the different manures, could give no satisfactory information, and I therefore did not complete the experiment as I had intended at the beginning. The land was prepared in all respects alike, and planted the same day, it is now in wheat, but I have as yet observed no difference in the growth of the wheat. The experiment at my Springfield farm resulted, if any thing, more disastrously than the first spoken of, for at no time could any difference be observed in the growth, and the product was anything but encouraging.

2nd. I endeavored to ascertain the difference in the products of drilled and broadcast wheat, both with and without Guano; the ravages of the joint worm and the rust, which attacked the wheat at an early stage, so blighted the prospect for the wheat crop, that I abandoned the prosecution of that experiment also.

3rd. I then began an experiment with turnips on cowpen-land, and dressed about one half with De Burg's super phosphate. They came up badly, and made scarcely any growth to sometime in October, when some of my cows threw down the fence and ate off the tops of what had come up, but the whole would not have furnished grazing for one hungry cow for an hour.

In regard to the wheat drill, I would state that according to my limited observation and experience, it is a much better implement for rich, than poor land, the water from rains running along the furrows made by the tines, seems to make the land bake, and the appearance of the wheat, as compared with broadcast wheat on similar land, is, I think, not so good as on rich land. Again, regretting the indefiniteness, and much more the unprofitableness of the foregoing attempted experiments, I respectfully submit the same in discharge of the duty imposed upon me. WM. R. BLAND.

April 14th, 1859.

Moral beauty, the reflection of the soul, is as superior to superficial comeliness as mind is to matter. It is a halo which will win worshippers, however unadorned the shrine whence it emanates; for she who looks good cannot fail to be good looking.

Great talkers are like modern banks; they issue ten times the amount of their capital.

The pleasure of doing good is the only one that never wears out.

From the Transactions of the Virginia State Agricultural Society.

An Essay

On the Use of Compost Manures in Seeding Wheat with the Drill, and on Draining Basins on Table Lands by Boring with the Post-hole Auger.

[A Premium of Twenty Dollars.]

LINDEN, Oct. 18th, 1858.

Edmund Ruffin, Esq., President Va. S. A. S.

MY DEAR SIR:

I have often reproached myself, because I have heretofore contributed so little to the annals of the Agricultural Society of Virginia. It has not been, as you know, from lack of zeal in the cause, but really because I have had nothing new, or that might not be found in books to communicate. I have lately, however, adopted several practises in sowing wheat, which is not entirely new, have at least not been generally pursued, which seem to me to be of public interest and not unworthy of permanent record. These practises are, 1st, Sowing wheat on corn land with the drill, without plowing; 2d, Sowing wheat with compost manures in large quantity, mixed with guano, through Seymour's drill with the attachment; and 3d, The use of the post-hole auger to bore holes to relieve the basins in our table lands from surplus rain water.

Last fall, for the first time, I adopted the plan of sowing wheat on corn land with the drill, without plowing. This was done at the suggestion of a gentlemen from Culpeper County, who told me he had successfully practised it. The season was very dry and the land somewhat baked, which rendered it necessary to precede the drill with a heavy harrow. I was somewhat discouraged by the opposition of my neighbors, yet nothing daunted I proceeded until I had put in the entire corn field on this place, and part of a field on another farm. The wheat came up beautifully and continued to grow in the most promising manner, until near harvest, when one field was entirely destroyed by hail, and the other so damaged by mildew and other diseases, that destroyed nearly the whole crop in this region, that the yield was greatly diminished. Yet I have no reason to be discouraged by the experiment. I had an abundance of straw, and should doubtless have had a satisfactory yield of wheat but from the disasters alluded to. I am pursuing the same practice in the present sowing, and have already sowed the entire corn field on this farm, and shall proceed to use the drill on other farms to the end of the season. The wheat on the corn land here has already come up with great regularity, and I think promises well. The land this season being in fine order, the harrow has been in a great measure dispensed with. When the field in corn has been cultivated flat, and kept clean, there can be no preparation more neat or efficient than drilling. The advantages of this practise are 1st, that it encourages thorough preparation and the neatest cultivation of the corn land, thereby greatly increasing the crop of corn, 2d, it saves more than half the labor of putting in wheat on corn land, which as usually sown is a very tedious and perplexing operation, and 3d, the sowing is more perfect than it can be done in any other way without great labor. If the land is not clean, a hand should follow the drill to remove any briers, &c., that may infest the field, and to cover any grain that in such spots may be exposed. When the land is clean however, this is entirely unnecessary; the wheat will be much more effectually covered than it can be by the harrow or any other implement except the plough. I would not recommend this practice, however, except where the land has been well cultivated, and is soft and friable as upon good loams.

Two years ago I paid eighteen hundred dollars ($1,800) for guano. With short crops and falling prices I found it inconvenient and inexpedient to incur again this heavy tax, and I determined to look around for some cheap substitute for guano, and to use the drill to economise the guano that I might purchase. Accordingly last fall I bought but five tons of guano, and contracted in Alexandria for two thousand bushels of ashes, which I had heard had been used with success through the drill in Fauquier and King William. I ordered at the same time from Baltimore, Bickford & Huffman's Drill. Owing to the great demand my order could not be filled, and I was under the necessity of purchasing from Rollon & Eastham in Fredericksburg, Seymour's Drill, which turned out to be precisely the thing I wanted, and for my purpose seems to be a perfect implement. Only 600 bushels of the ashes contracted for could be supplied. With five tons of guano and six hundred bushels of ashes, I had to perform the almost impossible task of manuring for a large crop of wheat. The best portions of the fields were sowed broadcast without manure, and I set about with all diligence to procure materials for the drill to supply the place of the guano. The farm yards, quarters and every spot where fine manure could be collected, were explored and all the enriching materials that could be found, scraped together, and after being sifted well, mixed with guano and prepared for the drill. In this way I collected manure enough to dress about (175) one hundred and seventy-five acres. I applied about ten bushels of the compost to the acre, and found when I finished, that I had used an average of (56) fifty-six pounds of guano to the acre. The crop, as before stated, was extremely promising, and I have no doubt, but for the disasters of the last season the result would have been entirely satisfactory. A portion of the guano was applied broadcast.

In order to be better prepared for this season, I set about collecting materials for compost as soon as I had finished hauling out the spring manures. The yards were scraped, ditches scoured, and all the materials suitable for the purpose, were hauled together at odd times and put under shelter in a cow house in the stable yard, and as the pile increased from time to time, the liquid drainings from the stables, from the reservoir in the stable yard were poured on it, and ground plaster sprinkled over it. All the liquid manures from the laundry, kitchen and house were used in the same manner. The result was, that at seed time I had a bed of the richest compost containing more than a thousand cubic feet, and being very compact, when cut down with the spade and sifted, it furnished largely over a thousand bushels ready for the drill. With this compost and such additional materials as were collected from the quarters, &c., &c., I have this season drilled on this farm one hundred and twelve acres, using from 60 to 70 pounds of Kettlewell's Manipulated Guano, and from ten to fifteen bushels of the compost to the acre. I suppose about a quarter of a ton of the compost has been applied to the acre. The drill has put in up to this time one hundred and thirty acres, and will, during the season, put in more than two hundred. It is now at work on my farm on the Potomac, and for want of prepared compost, I am using finely decomposed salt marsh earth, from the banks of a large ditch dug through the marsh some years ago. I visited the farm yesterday, and found that this material, with the scrapings from the quarters and the usual proportion of guano, make a very rich looking compost for the drill. Farmers on tide-water have in this material an inexhaustible source for the manufacture of the richest compost. If my experiments should turn out successfully, I shall save in the cost of guano for two hundred acres, about eight hundred dollars, ($800,) and the labor saved in using the drill instead of broadcasting will, I think, be equivalent to the labor of preparing and applying the compost. The wheat drilled with ashes and guano did not produce as well as that dressed with guano and other manures, used with the drill last season. For that reason I purchased no ashes this year, but have relied entirely on my domestic compost. It is unnecessary to remark upon the great saving to the people of the commonwealth, which must be the result of this practise should it prove successful and become general. The compost requires a sieve somewhat coarser than that commonly used for guano. A cheap and admirable one may be made readily with a box of pine plank two feet square and six inches deep, the bottom to be checked with chalk in squares of an inch, and a hole bored with a half inch brace bit at each intersection—the hole to be smoothed with a heated iron rod. Seymour's drill is much the best for this purpose that I have seen. It sows the wheat with perfect accuracy in any desired quantity, and will distribute from one bushel to thirty of compost to the acre if it be fine and dry, and is so readily adjusted that the quantity distributed may be changed without appreciable loss of time even in the same row, so as to accommodate the manuring to the varying quality of the land. The tires are heavy, and do their work effectually even in rough land. I use four horses to give steadiness and power to the machine, though two would work it very well in a clean fallow.

I have four years observed that the wheat growing on the bottoms or basins of our table lands, although they seem dry, is frequently injured by surface water, and winter killed. These spots cannot be drained by ditches, and the deepest ploughing is only a partial remedy. It occurred to me that holes bored to the depth of several feet with the post-hole auger would enable the rain water to pass off through the sandy substratum. I accordingly procured one, and have caused all the low spots in my wheat fields here to be bored to the depth of about four feet. I found the first two or three feet exceedingly hard and impervious to water, but at between three and four feet below the surface, a porous sand is reached, through which the water will readily pass. The result is yet to be seen, but I have no doubt of the success of the operation. Such spots have been sometimes drained by sinking small wells and filling them with stones within a foot of the top. This involves labor, and in Eastern Virginia we have no stone to fill the wells. Elkington, in his system of draining, used boring extensively, but it was mainly for the purpose of tapping secret springs, and drawing off the water on the principle of the artesian well. I am not aware that boring with the post-hole auger to let off surplus rain water through a porous subsoil has heretofore been practised. The auger makes a clean hole about eight inches in diameter and four feet deep.

Please, my dear sir, present these suggestions to the Society for what they are worth. I shall be most happy if they should prove of any service to the agriculture of Virginia.

I remain with sincere respect and esteem,

Your friend,

WILLOUGHBY NEWTON.

Decoration for Houses.

The civilizing, softening influence of art is acknowledged by all who have studied their fellow-moral and mental development, and the accumulation of objects of interest and beauty in a house tends to knit more closely the bonds of family affection, and changes the four walls from a cold dwelling place into a sacred and holy home. All the feelings which spring up in every true man's or woman's breast at the utterance of that word, *home*, are feelings of association, and not of mere locality, and hence wherever we go, and at every stage of our lives, if the associations are pleasant ones, we look back with glowing emotion on the home of our childhood, and to the one we have ourselves created. Dryden beautifully says:—

"Home is the sacred refuge of our life."

And it should be our endeavor to decorate this place, of all others, with lovely objects, and nature's beauties or simple works of art. Unfortunately, there are many that cannot afford to buy these decorations, who still have the desire to possess them and the taste to appreciate; therefore, we will tell our readers how some very beautiful and interesting objects of art and nature may be made at little or no expense.

Green is a color that is ever suggestive of pleasure, and it is stimulating to the eye, and Nature's own tints may be obtained at any season of the year, combined with graceful vegetable forms, by either of the following ways:—Take a carrot, and having cut off the green, cut about the thickness of a cent off the top, let this float on a saucer of water in a warm room, and it will quickly begin to sprout, presenting an object of beauty not excelled by any artist, because it is the work of the laws established by the Grand Artificer of the Universe. Another beautiful decoration may be made from a pine cone. One should be procured that is dried and opened, and the different circles should have grass seed or mustard and cress sprinkled in them, and then placed in a wine glass of water; in a few days the warmth and moisture will give the burr or cone life, and the circles will close upon the seed, which, in its turn, shortly germinates, and, sprouting out all over the burr, makes an harmonious contrast cf color between the lively green and sombre brown that has a truly pleasing and novel effect, actually refreshing all who look upon it.

The growing acorn is a very pretty and interesting object to study, and an ornament that teaches while it gives delight. It is thus prepared: Cut a circular piece of card to fit the top of a hyacinth-glass, so as to rest upon the ledge and exclude the air. Pierce a hole through the center of the card, and pass through it a strong thread, having a small piece of wood tied to one end, which resting transversely on the card, prevents its being drawn through. To the other end of the thread attach an acorn; and having half-filled the glass with water, suspend the acorn a short distance from the surface. The glass must be kept in a warm room; and in a few days the vapor from the water will hang from the acorn in a large drop. Shortly afterwards the acorn will burst, the root will protrude, and thrust itself into the water, and in a few days more the stem will shoot out at the other end, and rising upwards, will press against the card, in which an orifice must be made to allow it to pass through. From this stem small leaves will soon be observed to sprout, and in a few weeks there will be a handsome, though dwarf, oak plant.

The forms of crystals are very educative, in an artistic sense, their cold and distinct outlines cultivating an acquaintance with geometric forms, and they are capable of combinations that produce a broad and rugged effect. Alum is a good substance to c A piece of wire may be taken and two or form any object that fancy may dicted over then placed in a hot saturated soluk of it alum which, as it cools will deposit c. upon the wire, thus producing a crystal ment of great beauty. These crystals translucent, may be colored to suit the f by the addition of coloring matter, tum making them yellow; litmus, red; logwo of purple; and common writing ink, black. As piece of coke may be made to assume the appearance of a new mineral by placing it in an alum solution, as the crystals will avoid the smooth portions, and deposit themselves only on the rough and broken parts. Sulphate of copper or blue vitrol may be substituted, for alum, but this is a positive blue, and the color cannot be changed.

We think we have for the present given a sufficient number of hints how each home may be made cheaply into a place of ornament as well as necessity, and these little things scattered about the rooms of a house decorate and soften the asperities of papered walls and rigid furniture, adding a look of comfort and a feeling of repose that is the very concentration of true home life. As a people we neglect *taste* in the surroundings of our lives, which should be cultivated; and such little things as we have been describing are important aids. and help the man, the woman and the child to better appreciate the truth of that line of Keats'—

"A thing of beauty is a joy forever."

From the Canadian Agriculturist.

Death of Professor Low.

We regret to learn from the last number of the *North British Agriculturist*, that David Low, Esq., late Professor of Agriculture in the University of Edinburgh, is no more. Three or four years since he resigned his chair in consequence of the declining state of his health, and was succeeded by John Wilson, Esq., who is personally known to many of our readers, and who, it will be recollected, visited Canada during our last Provincial Exhibition at Hamilton, and who has evinced, on more than one occasion, a desire to bring our productions under the favourable notice of the British public.

Mr. Low, it appears, was a native of Berwickshire, and his father was extensively engaged in the management of landed property, and enjoyed a high reputation. His son soon manifested a disposition to follow his father's pursuits, for post. I ie afterwards showed the highest marsh ɛtions. He likewise took an active ditch d the management of his father's ago. Iive farms in Berwickshire, which that tthe means of greatly improving his the wledge of practical agriculture, for guamh he was afterwards so distinguished.

for tn the year 1817 appeared Mr. Low's in ŝt work, entitled, "Observations on the thresent state of landed Property, and on nhe Prosperity of the Landholder and Far-lmer." The termination of the war had greatly reduced prices, and great agricultural distress was consequently felt. The treaties was characterized by mature judgment and marked a sympathy with the position of the tenant farmer, and secured for the author an early and high reputation. In 1825, Mr. Low removed to Edinburgh, where he afterwards resided. In 1829 the *Quarterly Journal of Agriculture* was commenced, mainly at his suggestion; a work that has been since published in connection with the Transactions of the Highland Society, which has done good service to the cause of British agriculture generally, and to which Mr. Low was a regular and most valuable contributor. In 1831, he succeeded Mr. Coventry as Professor of Agriculture in the University; a post which he filled with distinguished honour and ability for near a quarter of a century.

In the Highland Society, Mr. Low always took a warm interest, and rendered it most important services during the greater portion of his life. He was successful in establishing an agricultural museum in connection with the University, towards which he enlisted the aid of the Government and several private individuals; contributing not a little himself.

The writings of Profssor Low were numerous. Besides the treaties already mentioned, and his numerous contributions to the *Journal of Agriculture*, and the *Transactions of the Highland Society*, he published, in 1834, "*The Elements of Practical Agriculture*," a work of great original merit which has gone through several editions, and was soon translated both into French and German, and highly appreciated on the continent. His large and costly treatise on "*The Breeds of the Domesticated Animals of the British Islands*," in two large quarto volumes, appeared in 1842. It was illustrated with coloured portraits of the animals painted by Mr. Shiels for the museum, the portraits reduced by Nicholson; the price being necessarily high, 16 guineas. The French Government immediately ordered its translation. In 1845 appeared a fuller treatise on the Domestic Animals than was contained in the expensive illustrated edition, without plates, which is the best work on the subject in the English language. Another work soon followed, "On Landed Property and the Economy of Estates," a work which enters very fully into the principles and practices of territorial management. The first edition of an "Inquiry into the nature of the Simple Bodies of Chemistry," came out in 1844, containing many ingenious speculations, which excited considerable curiosity and attention, so that a third edition appeared in 1856.

Professor Low died in the 73d year of his age. His character was high-toned and unsullied, his manners gentle and unassuming, and his loss will be long felt by a very large circle of admiring friends and readers of his works. "So long as the man of integrity and high principle is esteemed and venerated, so long will the memory of David Low remain a bright example in the performance of duties which require a combination of such qualities as sound judgment and high moral rectitude."

Rotation and Deep Soil—A Corn Experiment.

Regular rotation of crops and deep plowing are working wonders upon some of the old and low-worn farms of New England. In the discussions before the Maine State Board of Agriculture, which met at the seat of Government in January, many of the delegates bore striking and uniform testimony to the value of both these practices, especially upon lands that had been cropped hard. One of the members mentioned a field of fifteen acres, "badly bound out," which was plowed three inches deeper than ever before, and after an application of three bushels of Plaster of Paris, produced a yield of 600 bushels of oats. This is forty bushels to the acre. Another reported a yield of 82 bushels shelled corn per acre—56 lbs., to the bushel, from a field similarly treated.

Results very like these could be obtained from many of the old fields in Kentucky, which now grow nothing but sedge and briers, if deeply plowed, and the application of plaster were substituted by a generous quantity of barn-yard manure, or a compost of which the base should be stable dung and scrapings from the woods.

We have our mind's eye now upon an old field, twelve miles from Louisville, which was treated in this manner three years ago, and gave a yield of corn in return that much more than paid expenses. Without further preparation it was seeded to grass, sown upon the corn stubble, and will this coming season be more than fair pasture or meadow, for one or the other of which it is designed. The corn, in this experiment, was manured in the hill.

Our farmers complain of the great labour and heavy cost of such experiments. But such complaints are without reason. Every farmer who keeps merely two or three horses, four or five cattle, a half dozen sheep, and a dozen hogs, if he will only litter his stalls, pens, and barn-yard, with the cheap litter afforded by the woods a short distance from his dwelling house, in quantities enough to furnish his animals with comfortable bedding, he can have every year, by planting time in the spring, a mountain of compost, such as we have described, that will perfectly astonish his own eyes.

So much for the cost of that part of the experiment. It really costs nothing, for it will pay for itself in the increased comfort supplied to his stock, and the diminished quantity of food necessary to carry them through the winter. As for the labour and expense of hauling out, that is not very formidable, when you post up and look the thing right in the face.

In the instance to which we have referred, after the field was checked off for the seed, a two-horse wagon and three men manured four acres per day—giving to each hill a large shovelful of the compost. The actual expense in this case was probably two dollars per day, but in any case would not be over four dollars, or one dollar per acre. Without the manure, the old field might possibly have yielded 25 bushels to the acre; with it, it yielded about 40 bushels. Difference—15 bushels, which, at only 33½ cents per bushel, is $5.

All this is clear gain, for the cost of hauling out and applying the manure is fully repaid by the condition in which the crop left the ground for grass.

After this field has lain in grass two or three years, it will probably be turned over for another trial, and we will then speak of it again.—*Louisville Journal.*

Domestic Receipts.

Artificial Flowers.—The beauty of these imitations of the floral world depends upon the taste and skill of the makers. The delicate fingers of woman and her quick powers of imitation, combined with an exquisite taste for the beautiful in nature, enables her to excel in this branch of art, which at present is carried to the highest pitch of perfection in the French capital. Although all the finest qualities of our artificial flowers are imported, still great quantities of them are manufactured in New York City, and they may be imitated by many females as a domestic recreation affording much pleasure. The materials required for them are velvet and fine cambric for the petals, and taffety for the leaves, with thin whalebone or wire for the stems. These are cut into the proper forms and pasted together with a solution of gumarabic. The colors to produce the shades are put on with a fine hair pencil in the same manner as drawings are colored and shaded. Carmine is employed to produce the red and pink colors; the yellow is a tincture of turmeric; green of distilled verdigris; blue, neutralized sulphate of indigo; and purple a tincture of orchil or logwood and the oxyd of tin. Great care is necessary in the employment of these colors.

To Clean Gloves.—Lay them on a clean board, and first rub the surface gently with a clean sponge and some camphene, or a mixture of camphene and alcohol. Now dip each glove into a cup containing the camphene, lift it out, squeeze it in the hand, and again rub it gently with the sponge, to take out all the wrinkles. After this gather up the cuff in the hand, and blow into it to puff out the fingers, when it may be hung up with a thread to dry. This operation should not be conducted near to a fire, owing to the inflamable nature of the camphene vapor. The receipts given in all the printed books we have consulted for cleaning gloves are barbarous.

Mahogany Stain.—The color of mahogany may be imitated with a strong solution of logwood and fustic put on boiling hot with a brush. The color can be reduced to any depth of shade according to the strength of the liquor employed. After it is quite dry the wood should be varnished and afterwards polished. A varnish made with dragon's blood dissolved in alcohol, and applied in two or three coats will make a very good imitation of mahogany. When dry it should be rubbed down with rotten-stone and oil.

Rosewood Stain.—This is made of a strong solution of logwood and red wood, commonly called *hypernic*. It is put on the wood, when hot, with a brush, the dark lines being produced by giving two or three coats, and the light shades one. By washing over the surface of this stain with a week solution of saleratus, it will receive a blueish tinge and appear of a darker shade. When dry, use any kind of varnish for the production of a polished surface.

Yellow Stain.—A decoction of turmeric and a little alum, or the grounds of beer and a little sulphuric acid, makes yellow stain on white wood. Diluted nitric acid brushed over white wood, then exposed to the heat of a stove, also makes a yellow stain; this is the most convenient one for imitating maple.

Browning Gun Barrels.—Mix one ounce of nitric acid and four ounces of the sulphate of copper in a pint of water, and apply this to the surface of the barrel, and set it aside to rust for two days. The barrel must now be rubbed with a stiff brush, washed with lime-water, dried, and afterwards varnished. It is sometimes necessary to apply two and three coats of the acid solution to obtain a proper coating of oxyd. The lime-water neutralizes any free acid that may be left on the iron.—*Scientific American.*

Edmund Burke's Idea of a Perfect Wife.

She is handsome, but it is not a beauty arising from the features, from complexion or from shape. She has all three in high degree, but it is not by these that she touches the heart—it is all that sweetness of temper, benevolence, innocence; it is all that sensibility which a face can express, that forms her beauty. She has a face that just aroused your attention at first sight; it grows upon you every moment, and you wonder it did not more than raise attention at first. Her eyes have a mild light, but they awe when she pleases, they command like a good man out of office, not by authority, but by virtue. Her stature is not tall, she is not made to an admiration of every one. She has the firmness that does not exclude delicacy—all the softness that does not imply weakness. Her voice is soft, low, music, not formed to rule in public assemblies, but to distinguish a company from a crowd it has its advantage, you must come close to hear it. To describe her body, describe her mind—one is the transcript of the other. Her understanding is not shown in the variety of matters it exerts itself upon, but the goodness of the choice she makes. Her politeness flows rather from a natural disposition to oblige, than any rules on that subject, and therefore never fails to strike those who understand good breeding, and those who do not.

What the Earth Gives Us.

Messrs. Editors:—Agriculture may be considered of great antiquity. It is probable, however, that it did not commence to exist with the first formation of society, for it is satisfactorily proved that mankind, in the early ages, derived their subsistence from hunting and fishing, and from the milk and flesh of such domestic animals as they possessed. It is hardly possible for any one, perhaps, to satisfy himself how long the period was from the formation of Adam to the time when agriculture began to exist. Scripture teaches us that Noah was acquainted with the art, and it is probable that his sons transmitted it to the world. History informs us that the ancient Egyptians were well acquainted with agriculture; and under the Roman government, the people of Italy, too, understood all the branches of husbandry nearly as well as the present inhabitants of that country. At the period of the Roman invasion of Great Britain, there is reason to presume that agriculture was but little known there, and very imperfectly practiced. The Romans, however, during the Augustan age, had become successful agriculturists, and at the time of the Roman invasion, the Roman soldiers showed conclusively that husbandry was well understood by them; and when they withdrew from the island, at a subsequent period, obvious marks of improvement in the agricultural art were plainly observable.

From the Conquest to the days of Henry VIII., husbandry had received but little improvement; and during the long period of five centuries, theoretical or scientific knowledge of the art was little sought after by the Britons. During the fifteenth century, books containing directions for plowing and tilling the land, began to make their appearance. From this time forward, to the present day, men of enlightened minds began to take an interest in the art, and have illustrated it in the most satisfactory manner.

Somebody has truthfully and appropriately said, that "Agriculture may be regarded as the breasts from which mankind derive their nourishment and support." On account of its usefulness, it is the senior of manufactures and commerce, both of which owe their existence to agriculture. To mankind it is of the first importance, because their temporal welfare and prosperity depend upon receiving a regular and sufficient supply of the various articles cultivated by the agriculturist, so essentially necessary to man's existence.

From the earth's surface, the navy is supplied with timber, cordage, and sails; while flax and wool, hides and tallow, madder, and other dye stuffs, are obtained for the world's consumption. By delving into the earth, the proper substances, such as limestone and marl, are obtained for the purpose of invigorating its surface and rendering it prolific. By penetrating into its bowels, we procure various minerals, such as iron, lead, tin, copper, and coal, which furnish employment to a portion of the community; and by cultivating the soil, man receives therefrom food, which enables him to live comfortably and prosecute energetically his various avocations.

If agriculture is neglected, mankind sooner or later become miserable; but if the common necessaries of life are plenty, society is happy, and the laboring man especially, is better remunerated and more comfortably situated for his toil. When provisions are scanty, other arts are at a stand, and science and mental improvements are neglected. Hence we see in our own favored America, where the means of subsistence are ample, and where labor is sufficient to provide food for us all, the unusual expansion of the mind, and the rapid strides we have made in other arts and sciences, and the dignified position we hold, at the present moment, among the nations of the globe.

Country Gent.

Paint to Endure.

Mr. Rivers says, that boiling coal tar with slacked lime, will make a shining surface on woodwork, and walls of any clay, or turf, which is as imperishable as stone: it is, therefore, better than all the plants in the world, for the outside work of these houses; and I have proved that rough surfaces may be made in this way, as durable and hard as cast iron, by using the dust from a smith's forge, over the tar, as soon as it is brushed on. I had six wooden spouts, each 18 feet long, 4 inches wide, and 6 inches deep, for a particular purpose, and the man who supplied them (God forgive him!) assured me that they would last three lifetimes, if they were kept painted. But they soon turned so leaky, that a painter, with nothing else to do, could not make them hold their parching jaws, for an hour together, in hot weather; so I took the painting of them into my own hands, and gave them three good thick coats of hot tar, and as much of the forge dust, everytime, as the tar could suck in. From that day day to this, these spouts have been as sound as a bell; and when I use tar for paint, I dust it immediately with that smithy dust, and brush off what is not fixed after the tar is quite dry.

[*Cottage Gardener.*

Analysis of the Sweet Potato.

TARBORO', N. C., 8th March, 1858.

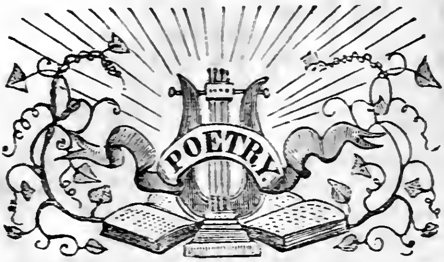
Mr. Editor:—In your February number you request some of your subscribers to forward you an analysis of the potato.

The following analysis is by Dr. Emmons, our State geologist:

1000 lbs. of Roots.	Contain.	
Starch	184.23	
Albumen	54.47	
Coagulable Albumen	19.40	
Cassein	9.70	
Sugar and Extract	53.49	
Dextrisu and Gum	6.93	
Fiber	17.09	
Gum Resin	2.07	
Water	641.72	989.10
Silicie Acid	0.24	
Sulp. Acid	0.16	
Phos. Lime and Mag	2.78	
Lime	08	
Magnes	07	
Potash	6.37	
Soda	66	
Chlorine	54	10.90
		1000.

I have known one cow-pen lot to fail in producing potatoes. Affording the mineral ingredients on a soil not otherwise suitable, will not make a good crop of potatoes, for I have tried some such soils, &c.

Yours, J. L. B.



Cottage Song.

BY JOHN S. ADAMS.

We've a cottage clothed with roses,
Near a wood
Where the singing birds of summer
Nest and brood:
There in early spring the daisies
Gem the sod,
Looking up to heaven above them,
And to God.

There in holy calm we worship
One above,
Through his works that all around us
Speak his love:
Read we there his will in every
Rock and tree,
While his blessings fall upon us
Rich and free.

Beautiful the morning sunlight
Cometh there,
Crowning Nature at her early
Morning prayer:
And at evening, when the twilight
Closeth round,
Still, devoutly at her worship,
Is she found.

We are not alone, for angels
Come and go,
Walking often through our cottage
To and fro;
Promising to guide and guard us
With their love,
Till we go to live among them,
Up above.

Simple life is ours, we follow
Nature's way,
Learning of her truthful lessons
Day by day;
Striving to fulfill our mission,—
Doing good:
Living happy in our cottage
Near the wood.

Better Late than Never.

Life is a race where some succeed,
While others are beginning;
'Tis luck at times, at others speed,
That gives an early winning;—
But if you chance to fall behind,
Ne'er slacken your endeavor;
Just keep this wholesome truth in mind:
'Tis better late, than never.

If you can keep ahead, 'tis well,
But never trip your neighbor;
'Tis noble, when you can excel
By honest, patient labor;—
But if you are outstripped at last,
Press on as bold as ever,
Remember, though you are surpassed
'Tis better late than never!

Ne'er labor for an idle boast
Of victory o'er another;
But, while you strive your uttermost,
Deal fairly with a brother.
Whate'er your station, do your best,
And hold your purpose ever;
And if you fail to beat the rest,
'Tis better late than never!

Choose well the path in which you run,
Succeed by noble daring;
Then, though the last, when once 'tis won,
Your crown is worth the wearing,
Then never fret, if left behind,
Nor slacken your endeavor;
But ever keep this truth in mind,
'Tis better late than never.

The Child of James Melville.

One time—my soul was pierced as with a sword;
Contending still with men untaught and wild;
When He who to the prophet lent his gourd,
Gave me the solace of a pleasant child!

A summer gift—my precious flower was given—
A very summer fragrance was its life;
Its clear eyes soothed me as the blue of heaven,
When home I turned—a weary man of strife!

With unformed laughter—musically sweet—
How soon the wakening babe would meet my kiss;
With outstretched arms, its care-wrought father greet—
Oh! in the desert, what a spring was this!

A few short months it blossomed near my heart—
A few short months—else toilsome all and sad;
But that home solace nerved me for my part,
And of the babe I was exceeding glad!

Alas! my pretty bud, scarce formed, was dying—
(The prophet's gourd—it withered in a night!)
And He who gave me all—my heart's pulse trying—
Took gently home the child of my delight!

Not rudely called—not suddenly it perished—
But gradual faded from our love away!
As if, still, secret dews, its life that cherished,
Were drop by drop withheld—and day by day

My blessed Master saved me from repining,
So tenderly he used me for His own—
So beautiful he made my babe's declining—
Its dying blessed me as its birth had done!

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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A Statistical View of American Agriculture.

ITS HOME RESOURCES AND FOREIGN MARKETS, &C.

An Address delivered at New York, before the American Geographical and Statistical Society, on the organization of the Agricultural Section.

BY JOHN JAY, ESQ.,

Chairman of the Section, and Foreign Corresponding Secretary of the Society.

MR. PRESIDENT AND GENTLEMEN:

In accepting the honor you have conferred upon me in the Chairmanship of "the Agricultural Section of the American Geographical and Statistical Society," it becomes my duty in opening the Section this evening, to say a few introductory words upon this branch of the Society's labors.

With your permission, I propose to glance over the field which the Agricultural Statistics of our country are destined to embrace, and refer cursorily to some of the aspects in which, looking at the past, and the present, and onward to the future, they commend themselves to all classes of our reflecting countrymen. The facts which they develop, concern alike consumers and producers, farmers and planters, manufacturers and all engaged in commerce, whose varying interests are so closely and inseparably allied. They have a common interest for all who watch the march of our Republic, and record its progress; and above all they deserve the careful study of the Legislators and Statesmen, who are constantly being called from private life, to frame its laws, to shape its policy, and to determine its destiny. For these, especially, the tabular results of American Agriculture, furnished each decade by the national census, will serve as a primer of practical knowledge, in which, guided by those principles that underlie all just government, they can learn the alphabet of legislative wisdom, and read easy lessons in political economy.

Most of the Governments of Europe have been greatly in advance of us in their appreciation of the value of statistics. England, France, Belgium, and Austria, have, for some years past, applied themselves earnestly to statistical investigation; and in those countries the truth is becoming generally recognized, that the world at large has an interest in the statistics of every nation, as tending to develop natural laws of universal concern to mankind.

In England, the labors of the Statistical Society, whose elaborate and most valuable publications enrich our Library, through the courtesy of the British Government, have aroused the attention of the people and of Parliament to the truth, that the science of politics finds in the statistical element its most solid foundation.

"STATISTICS," remarks M. Le Ray,* "are to politics and to the art of governing, what Anatomy is to Physiology in the study of the human body; the observation of the stars to astronomy; the study of the species of animals, plants, and minerals to the natural history of the globe; the analysis of the body to Chemistry; Experimental Physics to Natural Physics. The statesman who pretends to govern, without knowing the important facts which interest society, makes a more fruitless attempt, than the philosopher who should propose to make a general classification of the beings which compose the three kingdoms of nature, without knowing the essential characteristics of them."

The French Minister, in his opening address at the International Statistical Congress at Paris, in 1855, thus touched upon the Philosophy of Statistical Science:

"Whether Statistics prove the development of population, its increase or its decrease, its riches or its misery, or whether it registers the elements of production and of consumption among nations, it tends always—and that is its chief merit—to discover and develop all the general laws which may assist to render men better and happier."

This remark, although predicated of Statistical Science generally, is equally applicable to that part of it which pertains to Agriculture, and which has been hitherto so singularly neglected.

Commerce and Manufactures, by their "consolidation of power and concentration of wealth," have commanded to a far greater extent the attention of government. But the Census shows beyond the possibility of error, that even now, and without reference to its future developments, Agriculture is the largest national interest of this Republic; involving more than any other branch of industry, the wealth and the welfare of the country, and the labor and the happiness of the greatest number.

* The author of a recent valuable work on the occupation of domestic life and moral character of the working classes of Europe.

It is natural that such an interest should in every enlightened community establish among its members a common ground of thought and action, however otherwise they may be divided.

Thus we see in England and in the United States, amid scenes of party excitement, the warmest political opponents meeting cordially on the same platform at Agricultural Exhibitions, and in France at the grand *Exposition* of 1855, the same pleasing spectacle was exhibited.

The French Minister of Agriculture, in distributing the prizes, remarked that the catalogue, in addition to its Agricultural value, had a great political significance; and he then added, "Have you not remarked, that names the most separated by civil dissensions, have come together at this peaceful tournament! The reason is that Agriculture has its rewards for every legitimate ambition; that all parties have an equally powerful interest in it; and that the beauty of the productions of Agriculture, gives the measure, *and in certain respects the degree of civilization.*"

Looking at the employment of the free male population of the United States over fifteen years of age, we find that in 1850 the population engaged in Agricultural pursuits, was twenty-four hundred thousand, or forty-four (44.69) per cent; while the total number engaged in commerce, trade, manufactures, mechanics, arts, and mining, was only sixteen hundred thousand (1,596,265) or about thirty per cent (29.72).*

These proportions, it may be remarked in passing, differ materially from those of Great Britain, where the census in 1841, returned the persons engaged in commerce, trade, and manufactures, at twenty-four hundred thousand (2,415,127) or twenty-six per cent (26.24) and those engaged in

* The other occupations and their proportions were as follows:

Labor, not Agricultural, ...	18.50
Army, ...	10
Sea and River Navigation, . . .	2.17
Law, Medicine, and Divinity, . .	1.76
Other pursuits requiring education, .	1.78
Government Civil Service, ...	46
Domestic Servants, ...	41
Other occupations, ...	41

De Bow's *Compendium of Census*, 1850, p. 128. *Table CXXX.*

agriculture as only fourteen hundred thousand (1,410,509) or fifteen per cent, (15.33).

Looking beyond the number of individuals employed in American Agriculture, to the amount of capital invested in it, you have been already told that the Superintendent of the census estimated the value of the capital represented by Agriculture in 1850 at five billions of dollars, and that represented by all other branches of industry at less than one billion, giving to Agriculture more than five-sixths of the whole; and although these figures may be but an approximation to the truth, the proportions are probably correct.*

Agriculture, by its products, adds to the wealth of the country some sixteen hundred millions per annum,† and in the State of New York, where the assessed value of the real estate is eleven hundred millions, (1,107,272,715,) notwithstanding the enormous wealth of the metropolis, the Agricultural interest pays *four-fifths* of the taxes.

Prof. J. F. W. Johnston in his Lectures on Agricultural Chemistry, says, that *nine-tenths* of the fixed capital of all civilized nations is embarked in Agriculture.‡

With these figures before us of the comparative population and wealth devoted to Agriculture, we can appreciate without effort the truth of the remark made by Mr. Webster, in his well-known agricultural address at Boston, on his return from England.

"No man in England is so high as to be independent of this great interest, no man so low as not to be affected by its prosperity or its decline. The same is true, eminently, emphatically, true with us. Agriculture feeds, to a great extent it clothes us; without it, we should not have manufactures, we should not have commerce. They all stand together like pillars in a cluster, the largest in the centre; and that largest is AGRICULTURE."

Apart from the general rule, that the Agricultural wealth of a country is undoubtedly the first test of its internal resources, and the condition of its people, extra-territorial causes seem to be combining to give an unusual and increasing importance to the Agricultural products of America.

The increase of population on the Eastern Continent, beyond the capacity of production, is investing the question of food in this age with a significance that never belonged to it before, and the growing demands for bread that come to us from Western Europe, give a world-wide interest to the Statistics of American Agriculture, far beyond that which they could derive simply from the wants of our own countrymen.

Consumption has there overtaken production, and henceforth, in England, France, Belgium, Holland, and a great part of Germany, the *food question* will be *the question* that must take precedence of all others, as the regulator of commerce, and entitled to the first attention and the wisest treatment on the part of Government.

In England, the turning point at which consumption overtook production, is said to have been in 1824,* and from that time, two causes are held to have been constantly increasing the disproportion. The first of these, the increase of the population enlarging the consumption of breadstuffs, and the second growing out of the first—the demands of that population in part, for animal food, calling for a larger supply of cattle for the butcher, and consequently for a larger breadth of grazing and arable land for the production of green crops to rear and feed them, thereby diminishing by so much the breadth of land devoted to bread crops.†

Upon the political importance of the Bread question in Europe, it is not necessary to enlarge. It is a matter within the

* Mr. Waring's paper on the Agricultural features of the Census. Vol. 2, Bulletin of American Geographical and Statistical Society, p. 191.

† Compendium of the Census, p. 176.

‡ 2d Ed., New York, 1857, p. 11.

* England imported corn from abroad long before this date, but in great part for re-exportation. Malthus, in 1803, speaks of England as having been an importing nation for twenty or thirty years; and remarked, "In spite even of the peculiar advantages of England, it seems to me clear that if she continue yearly to increase her importations of corn, she cannot ultimately escape the decline which seems to be the natural and necessary consequence of excessive commercial wealth. I am not now speaking of the next twenty or thirty years, but of the next two or three hundred."—*Essay on Population, American Ed.*, 1809. *Vol. II.*, 273, note.

† This subject is clearly treated by an anonymous correspondent, "S. C.," of the London Farmers' Magazine for 1857, in a paper headed "The Consumption and Production of England."

personal knowledge of the present generation. The famine of 1847, which in Ireland alone was attended by the loss of half a million of lives, and the succeeding revolution and rebellion throughout Europe in 1848, are fresh in our memories.*

To the existence and power of the French Government, as one of their own writers has remarked, the mildew on an ear of corn, or the *oidium* on a bunch of grapes, are of more vital consequence than the splendor of the Imperial jewels. or the marvels of a thousand handicrafts. Whatever in our day cuts off the small profits of the industrial classes in Europe, or threatens multitudes with starvation, strikes at the stability of the political institutions of the land, and wields a mighty influence whether for evil or for good.

The very existence of thrones may be affected—indeed some think their existence has been determined, by causes apparently insignificant as the rot in the potato, or the weevil in a grain of wheat.

This overplus of population and deficiency of food in Europe, is of such recent origin, and as yet so slightly felt, that as a nation we have hardly begun to realize that it is to be of permanent continuance. But European Economists recognize and appreciate the fact, that an inevitable and increasing demand for food, with an insufficient and diminishing home-supply, will give henceforth to the Bread question, an immense political, as well as moneyed significance; and the sufficiency of each successive crop at home and abroad, to satisfy the wants of the people, within the limits of their capacity to purchase, is become a question of constantly recurring and earnest speculation.†

France and England are competitors in the corn and cattle markets of the world. The price of food is becoming enhanced by the simultaneous demands of their merchants at all the sources of foreign supply; and this accounts for the singular fact that our agricultural returns are sought for abroad, with more eagerness than among ourselves; and that in the absence of official returns, the most accurate statements and approximations are to be found in "The Mark Lane Express," and "London

Mr. Mill seems not to have been aware—indeed, few of our own people are aware, of the large amount of foreign capital which is yearly introduced into the country by foreign emigrants, especially by the Germans.. Recent investigations on this subject by some of the Commissioners of Emigration, at New York, indicate an annual addition to our national wealth from this source, vastly greater than was generalty supposed; and this fact helps to explain the marvelous rapidity in the improvement and products of our Western territories as exhibited in the tables of the Federal Census. The suggestion in favor of a transfer of the capital now employed in the United States in the manufacturing of products for American consumption, to the production of food for British consumption, is not without significance, in view of the ability of the writer, and his clear-sighted advocacy of British interests.

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* Mr. Coleman, in his work on Continental Agriculture, thus speaks of the Irish famine of 1847:

"In a single country, by the loss of a single crop, at least five hundred thousand persons have perished, amidst the horrors of starvation, or by the diseases engendered and aggravated by famine."

† The following interesting remarks on this subject, are made by the eminent political economist, Mr. JOHN STUART MILL, in the second volume of his well-known work. (London, 2nd Edition, 1848, pages 297, 8.) "Suppose, then, that the population of Great Britain goes on increasing at its present rate, and demands every year a supply of imported food, considerably beyond that of the year preceding. This annual increase in the food demanded from the exporting countries, can only be obtained either by great improvements in their agriculture, or by the application of a great capital to the growth of food. The former is like to be a very slow process from the rudeness and ignorance of the agricultural classes, in the food exporting countries of Europe, while the British colonies and the United States are already in possession of most of the improvements yet made so far as suitable to their circumstances. There remains as a resource the extension of cultivation, and on this it is to be remarked that the capital by which any such extension can take is mostly still to be created. In Poland, Russia, Hungary, Spain, the increase of capital is extremely slow. In America it is rapid, but not more rapid than the population. *The principal fund at present, available for supplying the country with a yearly importation of food, is that portion of the annual savings of America which has hitherto been applied to increasing the manufacturing establishments of the United States, and which may now possibly be diverted from that purpose to growing food for our market.* This limited source of supply, unless great improvements take place in agriculture, cannot be expected to keep pace with the growing demands of so rapidly increasing a population as that of Great Britain—*and if our population and capital continue to increase with their present rapidity, the only mode in which food can continue to be supplied cheaply to the one is by sending the other abroad to produce it.*"

Farmers' Magazine," and are thence transferred to the columns of the American newspapers for the information of American farmers. Thus does individual enterprize seek and partially obtain those results, which governments alone can accurately furnish. The contemplative statesmen of those countries, especially of England, foresee that with a limited area, and an increasing population, the time is at hand when, despite every effort to postpone it, by improved cultivation, in which England now leads the world, their own productions will be more and more inadequate to supply the needs of their people, and the failure of a single harvest, according to an English writer, might be naturally followed by war, famine and disease.

A brief century ago a very different state of things existed. In 1756, M. D'Anquceille, a French political economist and statesman, remarked, that "England could grow corn enough in one year to supply herself for four."

Now, England is said to import food annually to the amount of some forty-five millions sterling, in corn, wheat, barley, oats, beans, meal, and flour; besides live animals, meat, cheese, and butter; and her population is increasing at the rate of a thousand a day.

The contrast between now, and then, is the more remarkable, when we remember that England is estimated to have three times as much land under cultivation as when D'Anqueille wrote, and that the ratio of her crops to the acre is doubled, if not trebled.

In France, despite the efforts of government to secure for the people sufficiency of food, the scientific researches of M. Payan, of the French Institute, on the public alimentation of France, confirm the inferences drawn by M. de Lavergne from the condition of the French peasantry. The nation, it is said, *have not enough to eat*, even to supply the natural wants of the human frame.

The official report of the products of the recent universal Exposition of France, in dwelling upon the agricultural ability of the empire to support its population—referring to the fact that France has raised in good years 97,000,000 hectolitres of wheat, which represents the sustenance of 32,000,000 of individuals, added, "and there are unfortunately more than 4,000,000 of our compatriots who are not in the habit of eating bread." Indeed it has been broached as an interesting question how far the physical deterioration of the standard of growth in parts of the French Empire is the result of an inadequate supply of nutritious food. Some plausibility is given to this suggestion, by the statement that the number of conscripts who are rejected on account of deficient health, strength, and stature, is constantly on the increase. Forty per cent are said to be turned back for that cause, and although since 1789, the standard has been three times reduced, as large a proportion of the conscripts is below the required height (five feet two inches,) as before the changes, showing, as the late Professor Johnston remarks, how closely the discussion of agriculture is connected with that of the most profound social evils.* The importance and dignity of the entire subject become yet more striking in view of the great truth so forcibly alluded to by Lord Stanley in his Address on Public Health, "That whatever exception may be found in individual instances, when you come to deal with man in the mass, physical and social decay necessarily go together."†

In Spain, whose central table-lands are reckoned among the finest wheat growing districts in the world, the culture is most rude and imperfect, and some tracts are partly overgrown with broom and daphne.

The governments of Europe are awake to the importance of the question. In France the Imperial Interdict is continued to September, 1858, against the exportation of grain, and for the encouraging its importation.‡

In Spain, similar measures are said to have been adopted. In England and Ireland science is making every effort to dis-

* On the authority of Rubickon as quoted by Prof. F. J. Johnston, in one of his addresses before the New York State Agricultural Society.

† Address, delivered before the National Association for the Promotion of Social Science.

‡ A writer on European Agriculture, in the London Farmers' Magazine, says: "France has made a greater advance in two short years than we have done in twenty. The present Emperor is doing much by his personal exertions and example to introduce good live stock and to improve the general system of cultivation. See M. de Trehounais' paper on the "Past and Present of French Agriculture," recently read before the Society of Arts.

cover and arrest the potato-rot, which is reported to be spreading also in France.

Throughout Prussia, Austria, Belgium, Holland, Bavaria, and most of the minor German States, the increase of population is attended not with an increase, but rather with a decrease of the breadth of land devoted to cereal produce. In France, that decrease has been made greater by the absorption of land in the cultivation of the Silesian sugar-beet, and a similar decrease is found in Western Europe, with the exception of Belgium and Holland, which are grazing rather than agricultural countries, and are themselves purchasers of foreign grain. And excepting also Russia, which is making extraordinary efforts, involving no slight revolutions, social and political, to maintain its markets, and so secure its agricultural supremacy. That mighty Empire, with a population of sixty millions of souls, and embracing in Europe, Asia, and America, one sixteenth of the whole world, presents many prominent points of similarity as well as contrast to the United States, which, without anticipating the rivalry that may hereafter arise between the two countries, invest with a peculiar interest for our own countrymen, the newly developed features of its imperial policy, and especially those which relate to the social elevation of its laborers, and the improvement of its modes of culture.

Agriculture, in the Continental States, is at a low ebb, and by no means keeps pace with the increasing requirements of the population.

For the supply of their wants, annually becoming greater, they begin to look in great part to the American Continent.—"One fact," says the Mark Lane Gazette, "is clear, that it is to Western America that we must in future look for the largest amount of cereal produce."

I have permitted myself, gentlemen, to dwell for a few moments upon the subject of the foreign demand for breadstuffs, for the reason that although that demand is of recent origin, and is still limited both in extent and degree, it would seem that in the natural order of things that demand must not only increase throughout the whole of Western and in parts of Eastern Europe, but extend to other quarters of the globe, and form a necessary feature of increasing prominence, in every intelligent view of the agricultural aims and resources of the United States.

While recognizing the truth that lies at the basis of Statistical Science, and that should never be lost sight of in an association like this, that fancy and theory are inadmissible, and that Newton's motto, *"Hypotheses non fingo,"* * should be our guiding rule, we cannot forget, that while England and France count their ages by centuries, our Republic is yet in its infancy, and that, in a general glance such as we are about giving to the agriculture of our young land, the view would be meagre and incomplete, were we not to notice the surrounding circumstances, that are beginning to shape its character and influence its growth.

With the facts before us to which I have referred, in regard to the existing demand for bread in Europe, let us now look at the general capacity of our country for affording a supply.

The number of square miles contained in the area of the United States of America, in the present year, (1858,) is within a fraction of three millions, (2,936,165,)† somewhat more than one third the area of North America, exclusive of the West Indies, and nearly double the area of all Europe,‡ excepting Russia.||

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* Quoted by Lord Stanley, in his very able address before the Statistical Society.

†

	Square Miles.
The area of the United States at the peace of 1783, was, . .	820,680
The purchase of Louisiana, 1819, added about, ...	899.579
Acquisition of Florida, 1819, .	66.900
Annexation of Texas, . .	318.000
Oregon Treaty, . . .	308.052
Treaty with Mexico, . . .	522.955
	2.936.166

—De Bow's *Compendinm*, p. 32.

‡ The area of North America is as follows:

	S. Miles.	S. Miles
United States, . . .		2.936.166
British America:		
New Britain, .	2.598.837	
Upper and Lower Canada,	346.850	
N. Scotia & N. Brunswick,	1.104.701	
		3.050.398
Mexico, ...		1.038.834
Central America, . . .		203.551
Russian " . . .		394.000
Danish " (Greenland) .		380.000
Total square miles,		8.002.349

—De Bow's *Compendium*, p. 31.

|| See note to this reference on next page.

Two countries in either hemisphere approach the United States in area; the one Russia, containing twenty-one hundred thousand square miles; the other Brazil, having twenty-seven hundred thousand square miles.

The aggregate population of the United States has increased from about four millions, (3.929.827,) in 1790, to twenty-three millions, (23.191.876,) in 1850. The estimated population for the present year, 1858, is a little over twenty-nine millions, now for the first exceeding the population of Great Britain, which in 1851 was about twenty-seven and a half millions. According to the ratio of increase from 1840 to 1850, the population in 1890 would be one hundred and seven millions. The annual increase from 1790 has been four times as great as Russia, six times as much as Great Britain, nine times as much as Austria, ten times as much as France.*

In 1850, the density of population for the existing territory of the United States, was about eight (7.90) persons to the square mile. In the New England States, the density was forty-two (41.94) to the square mile. In the middle States fifty-eight (57.79), while California and Texas together had less than one person to the square mile. When the increase of our native and foreign population shall invest with the density of New England the whole territory of the United States, its population will amount to one hundred and twenty-three millions. With the density of the Middle States, of fifty-eight (57.79) to the square mile, it would amount to one hundred and seventy millions.

The density of Spain (78.03,) would make it two hundred millions. That of France (172.74,) five hundred millions.—That of Great Britain (332.00,) six hundred and sixty millions, while the density of Belgium (388.60,) were it possible to support such a population on this continent, would give us eleven hundred and fifty millions. Such a population, however, or anything approaching to it, is a thing impossible in the United States, for the reason that a large portion of its territory is a barren waste, incapable of tillage. Such is the character of the space between the 98th meridian and the Rocky Mountains, denominated "The Great American Plain," and the space from the Rocky Mountains to the Pacific, with the exception of the rich but narrow belt along the ocean, may also be regarded, in comparison with other portions of the United States, as a wilderness unfitted for the use of the husbandman.*

I, therefore, do not mention these figures with any intent of digressing from the subject before us, into idle speculations on the future destiny of the Republic, based upon the extent of its area, but to direct your attention to the fact so intimately connected with a just view of American Agriculture, that making ample allowance for the unproductive parts of our territory, looking only to those parts whose fertility is known, the

‖ The area of Europe embraces 3.811.594 square miles. The area of some of the larger States is as follows, in square miles:

Russia in Europe,	2.120.397
Austria,	257.368
France,	207.145
Great Britain,	121.912
Prussia,	107.921
Spain,	182.270
Bavaria,	29.637
Hanover,	14.734
Swiss Confederation,	14.950
Greece,	17.900
Turkey,	210.585
Sweden and Norway,	293.313
Belgium,	11.390
Portugal,	36.510
Holland,	12.601
Denmark,	22.533
Naples and Sicily,	44.401
Sardinia and Piedmont,	29.276
Papal States,	15.892
Tuscany,	8.511

* The population of England in 1851, was 27.475.271; of Austria, 36.514.397; of France. 35.783.170; of Russia, in 1850, 62.088,000; of Prussia, (1849,) 16.331.187; of Turkey in Europe, (1844,) 15.500; of Spain, (1834,) 12.-232.194.

It is stated that Herr Dietrick, of the University of Berlin, estimates the population of the world as follows:

Europe,	271.000.000
Asia,	730.000.000
America,	200.000.000
Africa,	80.000.000
Australia, &c.,	2.000.000

Making a total of 1283 millions; of which the population of the United States, estimating it at thirty millions, is about one forty-second part.

* See a learned paper by Prof. Henry, on Meteorology in its connection with Agriculture. Patent Office Reports for 1856, p. 481.

country is capable of producing a vast excess of food over the quantity required for home consumption by its present and immediately prospective population, even with all the emigration that a wisely directed governmental policy may induce; and that it must be in part the industrial mission of the United States for long years, it may, perhaps, be for long centuries to come, to produce food for the consumption of foreign nations.

It may be said of America as it has been said of Great Britain, that she has a relative as well as an absolute existence, and this truth becomes very striking in this connection, when we look at her, not alone as the bountiful supplier of her own fast-increasing population, but as destined to become, in all human probability, above and beyond their wants, the greatest grain market in the world; ready to assist Europe on the one hand and Asia on the other. It grows more apparent when we consider not simply the large extent of her area, and the small density of her population, but the diversity of her climate, the fertility of her western prairies, her Mississippi Valley, her Atlantic and Pacific slopes, and regard at the same time the intelligence and energy of her farmers, her public schools, her agricultural associations, and her free press; the expanding influences of her institutions, and her commanding central position.

I need not, gentlemen, enlarge further upon the preeminent importance of American Agriculture as a national interest that is destined to furnish the bulk of our exports, nor of the statistics that pertain to its various branches.

The facts to which I have directed your attention, showing the wants of Europe and the capacity of America, are sufficiently conclusive on that point. But I may be allowed for an instant before leaving this branch of our subject to remind you that its increase of our exports is but one of the phases in which the subject is connected with the welfare of the nation.

Our national strength consists far less in the extent of our area than in the number, the youthfulness, the industrial and moral qualities of our people.

These indicate our productive power, which is to be guided into the most profitable channels. Whatever assists us in the development and direction of these characteristics, under the most advantageous moral conditions, contributes to our national strength, prosperity, and happiness.

How far American Agriculture, with its millions of acres yet unbroken, a population of thirty millions to feed, and a growing demand for breadstuffs in foreign markets, is calculated to aid that development, is a question to which I propose simply to allude, as one that will receive new light from each successive census, and from the increasing number of intelligent minds that will be engaged in scrutinizing and collating its returns, and in educing from them natural laws, marked by mathematical accuracy, and possessing almost the certainty of moral truth.

It may well be that those statistics shall assist us to solve the problem, at this time so momentous to the citizens of this metropolis, how we can most readily transplant the imported pauperism of our cities, to the prairies and valleys of the west: and enable us to convert a festering and dangerous mass of municipal corruption, into a healthful element of national prosperity.

It may well be, that by the successive returns of the census, great natural laws may be practically developed, that are as yet but partially and theoretically discerned: and that moral and economic questions which have long puzzled the philosophers and philanthropists of both hemispheres, and that now perplex and confound our politicians, shall be resolved into the simplest elements of political economy, governed by rules, which, although based upon selfish motives, will be found wide-spread as human intelligence, and permanent as the principle of self-interest.

Statistics to be thus available must be complete, and in England they are quite conscious of the comparatively slight value attaching to desultory, fragmentary, isolated returns, educed for special purposes and deficient in unity.

It is now regarded as an axiom, that comparative statistics cannot content themselves with partial and uncertain observations, but must always repose on reality, and always submit to the law of numbers.

Our learned foreign associate, Mr. QUETELET, who has introduced into the Science of Statistics, a new spirit of philosophic analysis, observes, that "All observation tends to confirm the truth of the proposition, that whatever concerns the human race, considered collectively, is of the order of physical facts. The greater the number of the individuals, the more completely does the will of individuals disappear, and allow the series of general facts which depend upon the causes by which society exists, and is preserved, to predominate. "We must admit," he remarks, "that on submitting to careful experiment unorganized bodies and the social system, we are unable to say on which side causes act in their effects with the greatest regularity."

Another of our foreign associates, Lord Stanley, early prominent among British Statesmen, and who, I may say in passing, has vindicated his ancestral claim to greatness, not simply by his wisdom and industry in Parliament, but by the earnest and philosophic spirit he has exhibited in scientific and philanthropic efforts, gave, not long since, an admirable exposition before the London Statistical Society, of the nature and objects of Statistical Science. Regarding it as dealing with man in the aggregate, and developing results that can be calculated with mathematical precision, and thus leading us, step by step, to the knowledge of the laws that govern the social system, Lord Stanley remarked, "When, therefore, in discussing social questions, we apply the statistical test, we are really doing nothing more than appealing from imagination to fact, from conjecture to certainty, from an imperfect to a perfect method of observation."

Bearing in mind the necessity of universality and completeness in all statistical returns, to insure accuracy, and certainty in our deductions from them, it is clear that the statistics of Agriculture should comprise as far as possible all the conditions, proceeds, and results of the agricultural industry of the country at a given time, and all the facts which may assist towards their proper appreciation in all their different aspects. For the performance of such a work throughout the length and breadth of a vast empire, it is obvious that the efforts of private associations or even of local governments, are utterly unequal.

This is singularly exemplified by a glance at the disjointed and unequal action of the State Governments on this subject.

In most of the States, there is a census taken at varying intervals of two, four, six, seven, eight, and ten years. In Connecticut, Kentucky, Maryland, North Carolina, and Rhode Island, there is no regular State Census.

In 1850, it was ascertained that in New Hampshire the last Census was in 1783. In New Jersey, there had been none in the present century, and in Vermont the last was in 1771. Massachusetts has taken the lead in the extent, accuracy, and minuteness of her statistical investigations. The recent New York Census of 1845, and that of 1855, prepared under the direction of the Hon. Joel T. Headly, Secretary of State, are probably the most complete of any. The Legislative appropriations of this State, for geological and agricultural purposes, have been liberal. In Ohio, the State Census is taken every four years, with yearly returns of the acres in wheat and corn, and their yield.*

Statistics are now recognized as the peculiar function of the State, in a sense in which no other science is so, and in the United States the Federal Government alone, has the power and the opportunity to give it the abundance, universality and accuracy that are essential to enable the American Statistician to avid the errors that are constantly occurring in the calculation of mean results from an insufficient number of data, and without sufficient opportunity to eliminate and allow for disturbing causes.

In Europe, there have been recommended by the recent Statistical Congresses as important accompaniments of an Agricultural Census, minute features, which however desirable, will be for us from the inevitable circumstances of our position, for a long time to come impracticable. They include a plan of surveys, by which the entire territory is to be surveyed and mapped in a uniform manner, on a scale of about three inches to a mile, the scale commonly adopted in England: with the boundaries of countries and townships, the triangulation, the details of roads, and where the lines are permanent, of farm and fields; fixing by districts the average value and character of the land, the higher types and values of the cultivation, the whole arranged with reference to ease of revision at stated periods. The scale of maps for villages and crowded districts, it has been suggested, might be fifty inches to the mile, with index maps, showing a considerable surface of the coun-

* M. De Bow's Introductory Remarks.----*Compendium of the Census, pp.* 23, *et seq.*

try, when minute detail is not required. I note the suggestion, to show the thoroughness proposed in Europe, and as one which may, perhaps, be advantageously adopted for special purposes, in some parts of our own country; and I will now call your attention to what has actually been accomplished towards the Statistics of American Agriculture, by the Federal Government.

A general Census has been taken in the United States every tenth year, beginning with 1790, in compliance with the provisions of the Federal Constitution, for the apportionment of representation and taxation among the States, according to their representative numbers; but until very recently, the Census has furnished few national data, upon the prominent branch of American industry.

Our governmental statistics have had reference to population, to revenue, trade, commerce, and navigation. They have of late touched upon the moral, the social, the physical condition, of the people; including religion, education, crime, and pauperism; while *Agriculture* received little attention, until, in 1840, it was partially included in the Federal schedules.

In the Census of 1850, one schedule out of six,* more full in its details, was devoted to agriculture. These schedules were prepared by a special committee in the Senate, and they were assisted by valuable suggestions from our co-laborer, Mr. Archibald Russell, whose services in this regard were publicly acknowledged by the able superintendent of the Census, Mr. De Bow, and who thus in advance aided in preparing the way for the labors of this association, whose infancy he so faithfully nursed, and whose maturer course by Sections, he has within a few months so auspiciously inaugurated.

The materials gathered in these Census, especially the last, despite the errors and imperfections incident to the inception of so vast an undertaking, afford a most excellent basis for future comparison; and indicate the respectful attention which Agricultural Statistics must henceforth claim at the hands of the Government, stimulated as they will be by popular pressure from without, by the demands of their farmers of the United States, recognizing at last in Agriculture a branch of industry not inferior to commerce or to manufactures, but one far surpassing them both in extent and importance; the great overshadowing interest of the nation, by which all others thrive, and which has the right to demand the constant, chiefest, and most enlightened regard, at the hands of their Senators and Representatives in Congress.

The Compendium of the Census of 1850, prepared by Mr. De Bow, of which an immense edition has been issued, embraced a summary of the returns of the former Census, and some comparative statistics of other countries, and forms an invaluable text-book for the student of statistics.

The ability with which the work was performed, and the appreciation it has met, afford good reason for believing that the Agriculture of our broad land, in its more prominent features, will be henceforth decennially photographed with such minuteness and accuracy, as to allow of the most thorough investigation and accurate deductions.

The area of our territory, which as I have already remarked, is about three millions of square miles, will soon be treated of by Mr. Poor, the Chairman of the section on Topography.* Without proposing to trench upon the duties of that section, or to do more than refer to the prominent features of our physical geography, I may remark that the calculations of the Topographical Bureau at Washington, show the existence of an interior valley drained by the waters of the Mississippi and its tributaries, nearly as large as the Atlantic and Pacific slopes together, and one-third larger than the whole domain of the Republic on the adoption of the Constitution.

The following table shows the area of each slope and its ratio to the total area of the United States.

* The schedules were as follows: 1. Free inhabitants: 2. Slaves; 3. Mortality; 4. *Agriculture;* 5. Manufacturing industry; 6. Social statistics. The superintendent suggests that there be but two schedules hereafter; one of Population, the other of Production, with proper instructions for compressing all required information in a compact and inexpensive form.

* Since the delivery of this address, Mr. Poor has given an admirable exposition of the larger features of the topography of the country, illustrating the subject by Mr. Shroeter's Mammoth Map of the United States and adjacent countries, which he subsequently exhibited to the Royal Geographical Society at London.

Territory.	Area in Square Miles.	Ratio of Slope of total Aeea of the U. S.
Pacific Slope	786.002	26.09
Atlantic Slope, proper	514.416	17.52
Northern Lake Region	112.649	3.83
Gulf Region	325.537	11.09
Mississippi Valley, drained by the Mlssissippi and its tributaries.	1.217.562	41.47
Total	2.956.166	100.00

Thus, over two-fifths of the National territory is drained by the Mississippi and its tributaries, and more than one-half is embraced in what may be called its middle region. One-fourth of its total area belongs to the Pacific, one-sixth to the Atlantic proper, one twenty-sixth to the Lakes, one-ninth to the Gulf, or one-third to the Atlantic, including the Lakes and Gulf.

As connected with the facility of water transportation, it may be interesting to add, that a calculation made at the Office of the Coast Survey, for 1853, gives for the total main shore line of the United States, exclusive of sounds, islands, &c., twelve thousand (12.609) statute miles, of which 54 per cent. belongs to the Atlantic coast, 18 to the Pacific, and 28 to the Gulf coast; and that if all these be followed, and the rivers entered to the head of tide-water, the total line will be swelled to thirty-three thousand (33.069) miles.

The general character of the soil between the Mississippi river and the Atlantic is that of great fertility, as also that on the western side of the Mississippi, as far as the 98th meridian, including the States of Texas, Louisiana, Arkansas, Missouri, Iowa, and Minnesota, and portions of Kansas and Nebraska; but from that meridian westward to the Rocky Mountains, and thence nearly to the Pacific, excepting the rich and narrow belt already alluded to along the ocean, is found in some parts a waste utterly barren, and generally the land is unfit for the support of an ordinary civilized community.* Of the entire area of the United States only about one-thirteenth part is improved; about one-eighth more is occupied but not improved. The entire number of acres occupied is some three hundred millions (293.560.-614) or nearly one-sixth part of the national domain.†

The olden theory in regard to the soil first occupied by settlers, broached by Ricardo and Malthus, and for a long time adopted without question, was that the best lands were first occupied by the pioneers of civilization; but this has been refuted by Mr. Carey, whose careful array of facts gathered from the history of various nations, including our own, seems to show conclusively that the richest lands are the last to be cultivated, and hence we may conclude that among the unoccupied portions of our country, there remains soil of greater fertility and ultimate value, than is to be found in the thirteenth portion now under actual cultivation.‡

The States and Territories among which these lands are divided, are forty in number, besides the District of Columbia, including within their organization, sixteen hundred (1620) county divisions.

The total number of farms and planta-

* Prof. Henry's learned paper on Meteorology, in its connectien with Agriculture.

†In Great Britain, including England, Wales, Scotland, Ireland, and the British islands, according to a table prepared for the House of Commons, in 1827, in statute, there were of cultivated lands 36.522,970 acres; of uncultivated, 15,-000.000; of unprofitable, 15,871,363; making a total of 77,394,333: of this total, 19,135.990 were in arable lands and gardens; 27,386,980 in meadows, pastures, and marshes; 15,000,000 wastes, incapable of improvement; 15,871,463 wastes, capable of improvement.

In France, there are 82,790,702 acres improved; 38,238,616 unimproved. In Austria, 138,-808.366—25,812,517 unimproved. In Prussia, 39,478,704, improved—28,141.156 unimproved.

‡ "The richest lands of North Carolina, to the extent of many millions of acres remain to this time uncleared and undrained, while men are everywhere wasting their labor on poor ones, yielding three, four, or five bushels to the acre. South Carolina has millions of acres of the finest meadow and other lands, capable of yielding immense returns to labor, and waiting only the growth of wealth and population; and so it is in Georgia, Florida, and Alabama. So entirely valueless are the richest lands of the west, south, and south-west, that Congress has recently granted them to the extent of nearly forty millions of acres to the States in which they lie, and the latter have accepted them."----*Principles of the Social System, by H. C. Carey. Philad.* 1858. *Vol.* 1, *pp.* 116-47.

tions is about a million and a half (1.449.-075,) the number of improved acres is one hundred and thirteen millions (113.032.614,) of unimproved one hundred and eighty millions (180.528.000;) the farms average two hundred and three acres to each farm, and average in value twenty-two hundred and fifty (2.258) dollars. The implements and machinery on each farm average in value one hundred (105) dollars. The proportion of improved land in the different sections of the country is as follows:

In New England 26 acres in one hundred.
In the South, 16 " " "
In the North-West 12 " "
In the South-West 5 " "

In the South, the number of acres to the farm is the largest, but the value is most in the Middle States, and the average value of the Union is eleven dollars (11.04) per acre, ranging from one dollar and a half ($1.41) in Texas, a fraction more in California, and five and a half (5.34) in the Southern States, to eleven dollars and a half (11.39) in the North-Western States; twenty dollars (20.27) in New England, and twenty-eight dollars (28.07) in the Middle States.

The published Census* exhibits very partial returns of the number of acres held by individuals in the several States; returns limited, in fact, to certain counties in particular States. Among them Louisiana and South Carolina are indicated as having more farms of large size than the others, Louisiana having among fifteen hundred (1,558) farms two hundred (206) of from one to ten thousand acres, and one of over ten thousand acres; while South Carolina, among nine thousand (9,400) farms, has fourteen hundred (1,472) of over five hundred acres, twelve hundred (1,230) of over one thousand acres, and sixteen of over ten thousand acres each. Among all, the smallest average number of acres to a farm is 97 acres in Maine, ranging upwards to about one hundred (120), in New York (113), New Jersey (115), New Hampshire (116), Pennsylvania (117), and Ohio (125), to upwards of two hundred in Maryland (212), Kentucky (227), Tennessee (261), three hundred in Virginia (340), North Carolina (369), Mississippi (309), and Louisiana (372), to four hundred (441) in Georgia, five hundred (541) in South Carolina, nine hundred (942) in Texas, and forty-four hundred (4,466) in California; but these two last averages clearly indicate that the division of the number of farms into the occupied area of the State territory, a great part of which is still very sparsely occupied, cannot give the true and actual average of the number of acres to each proper farm, and the mean average obtained in this way, of two hundred acres to each farm in the United States, would seem to be consequently only an approximation, and larger than it is in fact.

These farms, with occasional exceptions, as among the ancient manors of New York, of late conspicuous for anti-rentism, are owned in fee by the cultivators themselves, and this rule constitutes an essential element of difference in comparing American Agriculture with that of England, where the cultivators of the soil are nearly uniformly tenants, generally under terms of longer or shorter continuance, and sometimes at will, causing a separation and occasional clashing of those interests of the landlord and the farmer which are with us united in the same person.*

* Table CLXXXIX.

* Mr John Stuart Mill. in his well known work on "The Principles of Political Economy, with some of their applications to social Philosophy," in the chapter on the "Influence of Progress on Profits. Rents, &c., contends that the assertion of Ricardo, paradoxical as it may at first appear, is nevertheless sound, that the interest of the landlord is decidedly hostile to the sudden and general introduction of Agricultural improvements.

Mr. Mill argues that if the improvement were confined to one estate, it would clearly benefit the proprietors; but if it extends equally to all it is injurious, for the reason that whatever permanently reduces the price of produce, diminishes rent; and that, if by the increased productiveness of land, less land were required for cultivation, its value, like that of any other article for which the demand had diminished, would fall.

Correct as this reasoning may be in the abstract, and upon the premises assumed, that but a limited demand for arable land exists in England, I think, with great deference to so distinguished an authority, that it ceases to apply to the existing and prospective state of things in that country; since the demand for food in England, if we rightly read her statistics, exceeds the utmost limits of the supply that her arable lands, with all the assistance te be derived from modern improvements, are capable of yielding. For in this case it would seem, that the demand for food being incapable of supply at home, and all possibility of a failure in the demand for arable land being done away, the interest of the

What influence this difference may exert upon the character and progress of agricultural improvements, and how far the superior wealth, and to some extent, more liberal education of the English landlords is counterbalanced by the individual energy and enterprize fostered in America, by an undivided interest, are interesting questions that will be probably elucidated by a careful comparison of the future returns of the two countries.

Between the United States and France—although the lands in both are generally held in fee simple, or nearly so, a difference of similar importance is found in the average size of the farms.

Here the average is from 150 to 200 acres; there the average, although not so small as has been frequently represented, is probably but six or eight acres among four millions of the smaller proprietors, or about twelve acres to each farm throughout the empire, and these are frequently encumbered by ancestral mortgages.

To be continued.

From the British Farmers' Magazine.

Influence of Nitrogen on Crops.

MILBORNE ST. ANDREW FARMERS' CLUB.

A meeting of this club was held at Milborne St. Andrew on Wednesday evening, the 20th of October last, to discuss the subject of "The influence of Nitrogen and its compounds on Vegetation," introduced by Mr. W. C. Spooner, the eminent Agricultural Chemist, of Eling, near Southampton. There was a goodly attendance of members.

Mr W. C. Spooner said: Mr. Chairman, and gentlemen, the subject on which I have to address you is, I believe, as your Chairman has said, "The influence of Nitrogen on Vegetation." Now, it is very desirable, speaking of the subject of manures, to have some little separation of topics; because the importance and influence of the phosphates, and a few others, are now felt to be so great, that the moment you begin speaking of manures, you are sure to talk about phosphates and superphosphates; and the chances are, that being considered still more important in a district like this, the subject naturally branches off in that direction, leaving little opportunity for discussing on that occasion the proper subject of the evening. With regard to nitrogen, when I had the pleasure of introducing the subject to you before, you will no doubt recollect that I then showed you what were the various gases that composed animal and vegetable bodies, or, in other words, of which they were built up; it will, therefore, be unnecessary to do so on the present occasion, from your being aware of these components, and not having forgotten the observations which were then made on the subject. In short, I shall speak chiefly of nitrogen, and shall say but little of the three other organic bodies that enter into the structure of the earth, and the animals and vegetation existing on the earth. Nitrogen exists in the atmosphere to the extent of four-fifths of its entire bulk. It is a body of but little activity, and serves principally the purpose of diluting the oxygen of the air to some considerable extent. You all know that when a candle is burned under a close glass the light soon goes out. Water ascends and condenses on a portion of the glass, as part of the confined air is burned, and the remaining part consists almost entirely of the nitrogen which was in combination with the oxygen consumed. It serves in the air, then, to dilute the oxygen, whose powerful influence would otherwise burn up all animal and vegetable bodies, and, in fact, cause our planet to disappear from space after a brief conflagration. Therefore it is that the nitrogen of the atmosphere is of such immense importance. Yet it is a singular fact, and, indeed, I know of none which startled chemists so much when first discovered, that this apparently innoxious, weak, and harmless gas is the peculiar element composing animal bodies, flesh, and bodies capable of supporting and nourishing flesh. They were surprised when it was discovered that nitrogen was the gas peculiar to flesh as distinguisned from fat. Gluten, as distinguished from starch, was that part of the food which is capable of

landlords would be decidedly in favor of the general introduction of Agricultural improvements as tending to increase, not only the productiveness of their estates, but the annual pecuniary returns from every acre, since they would increase the average number of bushels to the acre, without diminishing the value of each separate bushel in market.

sustaining flesh and building up fabrics distinct from that which is merely deposited as fat, which serves the purpose of keeping the body warm, or of acting as fuel in the consumption by it of the oxygen of the atmosphere in the lungs, and thereby supporting animal heat. The question is "Nitrogen, what is it?" "Ammonia, what is that?" We are much more familiar with the word ammonia, by which we understand at once that pungent gas which largely escapes from our dunghills. Its strong pungent smell is chiefly due to the carbonate of ammonia constantly escaping from it. Ammonia is composed of hydrogen and nitrogen. Hydrogen is the gas which forms water—nitrogen, as already noticed, the gas which composes four-fifths of the atmosphere. By weight, three parts hydrogen and fourteen parts nitrogen from ammonia. Thus, when an analysis is given, fourteen parts of the constituent proportions of ammonia consist of nitrogen: the other constituents matter not; and it is the more correct when speaking of that which relates to food or manure as nitrogen, because, although the greater part of that which escapes is in the form of ammonia, other parts exist in it as a compound capable only of being converted into ammonia. You are all familiar with ammonia. Here is a liquid form (*pouring it out;*) any gentleman who may heartily sniff it (*passing it round*) will feel it to be strong. (*Laughter from the successive experimenters.*) Here also is some chloride of ammonia; that is, ammonia fixed by hydrochloric acid, commonly called muriatic acid; in passing it round, it will be found to possess none of the smell of ammonia. If, however, we mix a little lime with it (*mixes*) we shall presently see that this renders free the ammonia; and in passing this round, you will have an opportunity of testing the difference betwixt ammonia in combination and apart. We possess no evidence to show that nitrogen, although the ultimate and important element so essential in manures and in animal bodies, can be directly assimilated by plants. Otherwise it would soon perform a revolution in agriculture. Peruvian guano would no longer possess a monopoly, and the price of ammoniacal manures would cease to be what they are at present. They would be no longer of value, because the atmosphere, which contains no less than eighty per cent. of it would give abundance of this valuable ingredient. But it seems to be the design of Providence that man should only earn his bread by the sweat of his brow; and that only through the means of his labour and intelligence shall the fruits of the earth be raised. Providence, therefore, steps in and forbids the use of this important element, existing so largely in the atmosphere. It is necessary that nitrogen, to be of use, should assume another form and we have no evidence to induce us to suppose that the nitrogen of the atmosphere can be directly assimilated by plants. You are aware that carbon forms the great bulk of vegetable bodies, such as the root crops; it is derived principally from the atmosphere, partly from the soils, and very little from manure. It is principally obtained, I say, from the atmosphere; for, although it exists only in the atmosphere as carbonic acid to the extent of one thousandth, it is yet sufficient to build up the mighty forests that cover the face of the globe. Plants, by a very simple plan, imbibe the carbonic acid of the atmosphere, giving off the oxygen again, and converting the carbon into their own structures, which are not derived from nitrogen. When nitrogen becomes the food of vegetable bodies, it is more common for it to unite with hydrogen and take the form of ammonia. The effect of mixing two bodies without smell may then be perceived. Reverting to the experiment previously shown, you will perceive that the chemical effect of the alkali (lime) is to unite with the hydrochloric acid, and the ammonia flies off. This chloride of ammonia is more familiar to us as sal ammoniac. We have seen that ammonia is one of the forms in which nitrogen feeds plants; but there is another form—that of nitric acid—not the strongest acid we possess, but next to sulphuric acid in that respect, and better known as acquafortis. It is a powerful caustic, and yet composed exactly of the same elements as atmospheric air—nitrogen and oxygen. What is more extraordinary still, instead of the largest percentage of nitrogen, it has the smallest, and the largest of oxygen; but the proportions in which they unite produce one of the strongest acids in nature. I bring this before you because it is almost the only other form in which nitrogen becomes the food of plants. Nitrate of soda employed as a top-dressing, is composed of nitric acid and an alkali, the base being soda; and its great effect on vegetation is due to the nitric acid and not to the soda. The experiment has been tried again and again, and if soda were the element that yielded the benefit, we should not give £20 a ton, more or less, for nitrate of soda, whilst we could buy salt which contains as much soda for as many shillings. Mr. Pusey used nitric acid in a diluted form in one of his experiments, and the same effects were produced as if he had applied nitrate of soda. Ammonia and nitric acid both exist in the air. With regard to the nitric acid, a Frenchman greatly startled chemists by the announcement of the fact of a great amount of both ammonia and nitric acid existing in the atmosphere. But this only served to show that no single experiment ought to be relied upon, but ought to be tried by other chemists before being received as an established fact. Boussingault and Professor Way both found that they could obtain from rain-water nothing like the same quantity as the French chemist had succeeded in obtaining. The experiment of the one had been performed in the city of Paris, that of the two others with rain collected in the country; and the larger quantity of ammonia, which in cities arises from smoke, from the large consumption of fuel, from dunghills, and decaying bodies, than in the country, might create, in the atmosphere in the neighbourhood of towns, more than double the quantity in that of the country. This fact, in itself interesting, also accounts for the great amount of vegetation that succeeds frequent thunder showers in some root crops—not that lightning has any direct influence; but a thunder shower generally descends suddenly, and after a drought of some little extent, and consequently brings down with it whatever ammonia and nitric acid exist in the atmosphere. Way found that there was in a year's fall of rain per acre:—

Nitric Acid.	Ammonia.		Total Nitrogen.	
(1855)	(1855)	(1856)	(1855)	(1856)
lbs. 2.98 to 2.80	7.11	9.53	6.63	8.731

There being from 44 to 46 lbs. of nitrogen in an acre of wheat or barley, that quantity it will therefore be seen is considerably more than the rain can bring down, and the French chemist had possibly overrated the effect. It is thought by some that dew and fog are richer in ammonia than rain, but although they are somewhat richer, yet upon careful experiments it has been found that the quantity of dew per acre deposited in the ground is not more than 10 tons, whereas, the quantity of rain is 2,500 tons per acre. Professor Way, in his excellent paper on soils, has noticed that strong soils or clay have a great power of fixing ammonia; so, if we dilute a strong solution of ammonia and throw it over a quantity of soil, very soon all smell of ammonia will disappear. This seems to be a very wise provision of nature that a substance which costs so much money, and is of so much value, should not, like other alkalies, become rapidly soluble and soon washed out, but should thus be retained in the soil for the uses of vegetation. Not so nitric acid, although it also is of so much value applied in a particular manner to particular uses; it is soluble, and, unlike ammonia, soon washes out of the soil, so much so, that I would impress this observation on your minds that you may not be led to throw it away, or to find what you had done rendered useless. You may apply ammonia, as sulphate of ammonia, carbonate of ammonia, or ammonia in the form of guano, and it will be fixed by the soil without being washed away; but if you apply nitric acid in the fall of the year or in the witer, you run great risk of a considerable portion being washed out of the soil again. Thus it is that different results and effects occur. Some may say, "It agrees with my land excellently and answers my purpose, and I can produce six bushels more per acre when nitrate of soda is applied." Others may say, "I get nothing but straw—it has no good effect whatever." Now this greatly depends upon the mode of application. Nitrate of soda should be used only as a top-dressing, and never applied to an exhausted soil, nor unless there be vegetation then and there to take up that which is so valuable, and thus you run no risk of losing money in so valuable an ingredient. It will not do at all times to estimate the value of manure by the quantity of nitrogen; for it was found by a late experiment of Mr. Lawes, that a greater effect was produced by nitrate of soda on barley, than by an equal quantity of nitrogen in the form of sulphate of ammonia. I have myself seen, continually, similar effects produced upon grass and wheat, more particularly on strong land. This also shows that nitrate of soda should be applied late in the season, and never upon poor and exhausted soil, because it would act as a stimulant, supplying one particular element of vegetation only, and stimulating plants to put out their roots and extract from the soil all the other portions of nutriment necessary for their existence. When a manure produces this effect, it is undoubtedly a stimulant, and we should never apply nitrate of soda unless we are sure there is something to respond to the demands of the plant—that there is phosphate of lime and other elements present there to satisfy it. It is then the fact that nitrogen exists in various forms in manures. But if we apply lime or strong alkali, it is at once converted into the form of ammonia, and readily escapes. Guano owes its very powful smell to the quantity of carbonate of ammonia always escaping. Where lime exists in land its ammonia will be developed. Now, all land fit for vegetation, in a greater or smaller degree, possesses some lime—in this neighbourhood abundance of chalk, probably more than is wished: in others it is deficient, and it is necessary to add it before vegetation can take place successfully. Here is some of the ordinary manure for the wheat crop (*exhibits it,*) which, being used as an autumnal application, it is necessary should not be too rapid in its action. As the manure passes round it will be found to have little or no smell, and then it will be shown to smell as soon as a little of the alkali—possessing in itself no smell—is added. (*This was accordingly shown.*) Now, it has been pretty well proved, notwithstanding a vast amount of argument to the contrary, that the essential manure for the turnip crop is phosphate of lime, and that the equally essential manure for grain crops is ammonia, or nitrogen, in some form. You are aware that a great and not very good tempered controversy has arisen betwixt Baron Liebig, and Mr. Lawes and Mr. Gilbert, on this subject. But it was previously known to the agriculturists of this country that the proper manure for the wheat crop was ammonia, and that for the turnip crop phosphate of lime. It is not a new fact. We were well aware of it ten, twelve, or fifteen years ago, and this it would be easy to prove. But Mr. Lawes has instituted some very laborious experiments, which have set the matter still clearer; for he has well shown that whilst he continued to apply phosphate of lime to the root crops, he succeeded in raising a greater amount of roots year after year; whilst, on land which had no manure, they dwindled, in four years, from four tons to three tons, then thirteen cwt., and nothing in the fourth. He found, likewise, that he by no means produced the same effect by adding salts of ammonia to a considerable extent. He applied to a crop of turnips, in considerable doses, sulphate of ammonia, but, without the phosphates, and had no crop. Professor Voelcker, in the last part of the Society's Journal, has given the results of experiments which set this in a yet stronger light. If we adopt these experiments as our guide we should feel almost disposed to say that nitrogen and ammonia are totally useless to the root crops. But there is a drawback to them which I shall mention. It is that in spite of all his endeavours, Dr. Voelcker obtained only a half crop at best, viz., from fifteen tons farmyard manure, 7.16 tons; from nothing, two and a half tons, or rather under three; from six cwt. bone ash dissolved in sulphuric acid, from eight to nine tons; from sulphate of ammonia nothing (but as applied there is no doubt its pungency injured the seed,) and not more when sulphate of ammonia was added to bone ash than when it was not. We must be cautious, however, in building our superstructure on too narrow a basis; we must repeat these experiments. The following experiment, if I may venture to quote myself, is one which I made and published in a little paper ten years ago:—"I was anxious to ascertain what the effect would be of applying to the turnip crop an excess of ammonia. With this view, in the autumn of 1848, I applied to a given space of ground, being a wheat stubble, a liquid preparation of ammonia. I was fearful, if I applied it later, the strength of the application would destroy vegetation; indeed, it had this effect to a considerable extent on the weeds in the stubble, and also on the worms and other insects, which were found dead on the surface of the land, showing that a powerful alkali, such as ammonia acts as a poison on wireworms and other pests of vegetation—a fact in itself important, and consolatory to those who cannot divest themselves of the idea, when casting a few hundredweights of Peruvian guano on the surface of the land, that, while the cost of the application is certain, the benefit to be derived is altogether doubtful and hazardous. But to return to our more immediate subject: the stubble thus treated was plowed and cleaned in the spring, in common with the adjoining land, and, early in June, drilled with Skirving's swede seed, the whole being manured with superphosphate of lime—that is, both that which received the ammoniacal application, and that which did not. The seed vegetated well, and it soon became a good plant throughout the field; but after a very few weeks, the land which had received the ammoniacal application could be distinguished at some distance by the dark colour and remarkable luxuriance of the greens. This continued throughout the autumn, and, on examining them a week before Christmas, it was found that the luxuriant greens had been the precursors of huge and monstrous necks, twelve to eighteen inches long, and several inches in circumference. On cutting through these necks it was perceived that they contained nutritious matter similar to the bulb. It might be thought that these huge necks were forced on at the expense of the bulbs, but this was found not to be the case; for, on testing some average rods with the other parts of the field, it was found that while the latter proved to be at the rate of twenty-two tons per acre, the ammoniacal bulbs yielded at the rate of twenty-seven tons. In neither case did the individual roots reach a great size, in consequence of having been left too thick (no less than 160 to the rod,) which arose from the circumstance of the rows being drilled only eighteen inches apart, whilst the roots were hoed out as if the rows had been two feet asunder. I have no doubt the crop would have been greater if the number of roots had been one-third less. I shall call attention to the fact that it was not till some weeks that the ammoniacally-treated swedes were noticeable from the others: all came up equally well, and vegetated for some time with equal luxuriance, showing that the peculiar manure for the young plant is phosphate of lime in a soluble state. We learn from the experiment we have narrated that the peculiar effect of a large supply of ammonia to the turnip crop is to force on a luxuriant growth of greens and stems, but that this is not done at the expense of the bulb, but rather as an addition to it. At the same time, we might also draw the inference that a moderate application of ammonia is sufficient for the turnip crop." Professor Voelcker, however, found that a large quantity of sulphate of ammonia had no such effect on the greens: it was applied so late as June, broadcast, I presume, and in close contact with the seed—the other being applied in autumn, in a liquid form, to the soil. I am not recommending my experiment for general adoption, but you are familiar with the effect, however, of one or one and a half cwt. Peruvian guano, the effect of which on the autumn greens is to render them more luxuriant. There is none at first—but a visible effect afterwards, rendering them longer in ripening, whereby the mildew is to a great extent kept off, showing the importance of a mixture of ammonia with the turnip manure; and I can't coincide with those gentlemen in opinion who apply phosphate alone, as ammonia, whether in the shape of bone dust, half-inch bones, or Peruvian guano, is a decided advantage. The drawback I have said in Dr. Voelcker's case is, having obtained only a half crop at the best. It may be answered that each experiment fared alike. But it is important to observe that the atmosphere can supply, by means of rain and dew, a certain quantity of ammonia and nitric acid; now the quantity imbibed by a good root crop, such as turnips, is much more than that taken up by a small crop. In twenty tons of bulbs there is considerable nutriment and nitrogen. This, if absent in the soil, must be largely supplied from the atmosphere, from rain, and from the ammonia floating over the largely developed leaves. If sufficient with that in the soil to produce a good crop, the atmosphere may be alone sufficient to produce half a crop; and if we have here only a half crop, it is not proved that it is unnecessary or undesirable to apply ammonia to root crops. It is a pity the learned doctor, on a small portion of ground, did not water the crops; if he had supplied artificially what the rain failed to supply, he might have obtained different results. But this has been no fault of his; he has repeated the experiments for two years, and means to repeat them again; and as soon as he gets a good crop, say twenty tons per acre, we may begin to form a theory upon his facts. I don't object to anything he has done—no man experiments more carefully; no man is less likely to be led astray himself or to lead astray others. [The lecturer then sat down to enable any of the questions usual on such occasions to be put to him.]

The Chairman, at the conclusion of Mr. Spooner's lecture having announced his intention of departing from the usual mode of calling upon particular members to continue the discussion, expressed at the same time, a hope that any gentleman having practical questions to ask would put them.

Mr. Crane, as well as the Chairman and Mr. Dunham, then put a variety of questions, the objects of which, for the sake of compression, we must leave to be gathered from Mr. Spooner's replies, and

Mr. Summers spoke as follows:

Mr. Chairman and Gentlemen.—I have a few observations to make on an ammoniacal manure which I applied to cereals and vetches two years ago. The following is the analysis of the manure—this analysis I received from Professor Way:—

Moisture,	7.91
Organic matter, &c.,	10.17
Sand, &c.,	1.68
Soluble phosphate,	3.10
Insoluble phosphate,	0.47
Sulphate of lime,	5.82
Sulphate of soda,	14.14
Common salt,	33.83
Nitrate of soda,	15.38
Sulphate of ammonia,	7.30
Ammonia in organic matter,	0.20
	100.00

This manure was applied in March to a piece of wheat which was sown after old lea, and which I thought required some nitrogenous manure—the minerals being more abundant than available nitrogen. It was sown over the whole field with the exception of the two ridges which were left to see the effect of the application. Where the manure was spread, a much darker hue was soon perceptible, and the wheat got the start of that on the two ridges that were left unmanured. This dark green gradually died away, and the wheat was again the colour of that on the two unmanured ridges, but the left was wider and the plant was stronger. A few days before harvest it could be distinctly seen that the unmanured portion was at least three days later in ripening than that which had been manured, and I believe that there was quite one sack per acre more in the manured portion than on the two ridges which were left unmanured. I calculated that I got seven sacks per acre on the two ridges, and eight sacks per acre on that which was manured. The same manure was applied to barley which followed a crop of wheat—it was spread over a part of the field where the chalk was turned up by the plow through the little depth of soil. Here the effect was very striking, the produce being, I believe, doubled—both straw and grain. I also applied it to spring vetches on a thin chalk soil. These vetches were sown after wheat; it was only sown over a part of the field, so that, as in the other instances, I had the opportunity of judging of the effect. It caused no apparent difference in the growth of the vetches; but, what was very surprising, it gave great vigour to the charlock that was growing with the vetches—the plants were twice the height where this ammoniacal dressing was laid on. I do not approve of top-dressing as a rule, but where it is resorted to, and where it is required, I would recommend the following as a good mixture for cereals:—

Nitrate of soda,	25	per cent.
Sulphate of ammonia,	25	"
Common salt,	30	"
Vitriolized guano,	20	"
	100	

The nitric acid and ammonia in the nitrate of soda, sulphate of ammonia, and vitriolized guano, are of different solubility; therefore, where this mixture is applied, the plants will be supplied with food during their progressive stages of growth. In the vitriolized guano, we have also soluble phosphate, which is of special value to the barley crop. The salt I add, as a corrective of any tendency of the other compounds to produce over luxuriance.

Mr. Spooner, in replying to the observations which had been made, only wished they had been more numerous, assured that if the members would only draw a cheque upon their memory and experience, and give the club the benefit of the amount for which that cheque would be honoured, they would all of them derive advantage. The Chairman had commenced with the question why the nitrogen of the atmosphere was not made available by means of some chemical application? He could only tell him, that if he knew of such an application and could put them up to it they would be much obliged to him. Sulphuric acid, of which he (Mr. Spooner) manufactured largely, had, for one of its ingredients, the oxygen of the atmosphere; and as they could not obtain that from the atmosphere fast enough, they were obliged to have recourse to the use of nitrate of soda; and the oxygen which gave to sulphuric acid its pungency and potency was derived from the atmosphere by the aid of nitrate of soda. Of course he meant to say that it was converted from sulphurous to sulphuric acid by these means; and to sulphuric acid they (the farmers) were much indebted, for without it, or some acid equally strong, there could be no superphosphate of lime. Thus they could use up the oxygen of the air. But what would they think when he told them that whilst they did so, they were obliged to allow the nitrogen to escape up the chimney. If it only could be arrested, an important point might be gained, but chemists had united all their efforts to arrest it in vain. Sometimes, indeed, a shout had been raised like the false "hark hollow!" sometimes heard in fox-hunting; for the discovery after all had proved to be fallacious, and they were found to remain in possession of precisely the same amount of knowledge on the subject as before. The Chairman had next observed that nitrate of soda, being a stimulant, it was good for the outgoing tenant, but by no means desirable for the incoming tenant to employ. There was a certain amount of truth in this, but it would not do to take it. Good farming ought to be practised whether by the outgoing or the incoming tenant. If, indeed, a tenant be used ill, then he had every inducement to make hay whilst the sun shone; but he (Mr. Spooner) could hardly recommend it. And at the same time it was hardly desirable for the incoming tenant to despise the use of that which he saw other parties using year after year with advantage. It would therefore be prudent to use a certain amount of nitrate of soda and other salts. With regard to the top-dressing which Mr. Summers had recommended, it had its advantage, and they brought up wheat and barley crops by its means. A barley grower, whose produce was as good as any in the market, used some every year with profit. They must, in fact, resort to this or other means where their land was required to furnish crops; for if they only put on dung every four years something else was required to realize its advantages. If they improve their dung by feeding with corn or cake, or supplied the deficiency by means of artificial manures, what were they doing in the one case and in the other? Just supplying more nitrogen or more phosphate. Double the nitrogen and the phosphates, and they would double the value of their dung immediately. One ton of dung so enriched in the yard would, in fact, become more valuable than two tons; and this was the reason why the agriculture of England was now so superior that they could now produce eight or ten sacks per acre as easily as their grandfathers had produced six sacks—not that they applied more dung, but because it was of a better quality, with more ammonia, more nitrogen, more phosphate, and, consequently, capable of producing better crops. The question had also been started why lime sometimes weakened the soil, and why lands that had been overlimed were never so good again? Why? Lime was a powerful cause of the riches of the soil being used up. Ammonia applied to the land became fixed by the soil; but by lime and by water it became again soluble. This only showed that lime could not be dispensed with in modern agriculture, since it was so very active an agent in doing good and causing the riches of the soil to be freely used up. Thus it had been stated by one member of the club that his turnips, which had clubbed in sandy soils, when chalked grew properly. Now chalk was only lime rendered less potent. Where lime did not exist club-root would prevail. This was owing to the field itself and not to the turnips. But it had been stated that swedes had been good in a field so chalked, which could no longer grow good mangold. The injury in this instance was mechanical. The benefits of lime, however, were chemical. Lime was wanted to reduce certain acids which produced this disease called club-root; and if lime had been added instead of chalk, or if considerably less chalk had been added, the remedy would have held good without the evil. After some further observations on the advantages of the use of lime, Mr. Spooner concluded by saying that the subject was very copious, and it was impossible to do it entire justice, but enough had been said to show that nitrogen, in some form, was a manure peculiarly required by the grain crops. The effects of nitrogen were not mathematical; it was necessary to apply a considerably greater quantity of nitrogen, to the wheat crop, for instance, than to the bean; yet the analysis of the bean crop afforded twice as much nitrogen as did the wheat crop. This was a theory not dependent on the chemical composition of the manure, but on the physiology and properties of plants. The wheat was a most grateful plant; yet, as regarded ammonia, it would appear to waste more than was applied. If they were to apply thirty lbs., for example, as an experiment, expecting to get it back, they would be deceived, as they would not get back half the nitrogen, contained in the manure. This showed the advantage of rotations in which one shift bequeathed to another a vast amount of nitrogen, the material of future crops, and aided in deriving it from the soil and the atmosphere by another direct application of agents. There was no better system than a wise and discreet rotation of crops; and, without making extravagant experiments, they must farm liberally if they would farm well and farm successfully.

On the motion of the Chairman, which was duly seconded, the club assented to the expression of thanks to Mr. Spooner, to whom there could be but one opinion of their being greatly indebted. He had supplied them with that kind or information which they most wanted as farmers. They wanted to know what kind of manure to purchase, and what kinds were wanted for particular soils. For, as different soils required different descriptions of manure, it was only the chemist, who deeply studied the matter, who was enabled to tell them how to lay out their money to advantage. That was not the first time that Mr. Spooner had travelled from home by the mail train to contribute to their information. His labours were of a practical nature, which they could all understand and appreciate. And they would all accord cordially in awarding him a vote of thanks. He (the Chairman) could only say that, so far as he was concerned personally, of such a practical nature were Mr. Spooner's remarks, that he had learnt more that evening concerning manures and their application than he had ever learnt before.

After a few words of acknowledgement from Mr. Spooner, the meeting separated; Mr. Spooner just observing that the question had arisen whether dung should be applied to the surface and distributed, or plowed in at once, or matured in the dunghill before-hand. He believed, himself, it was far better applied to the surface, which would permit as little as possible to fly off, as the rain water thus washed in its soluble part, and when the plow turned over the ground, instead of its being all four or five inches under, the greater part of the ammonia would be acting at only one or two inches deep from having been previously washed in.

For the Southern Planter.

Pea Fallow, Tobacco Growing, &c.

Mr. Editor:

As a zealous farmer, wishing to do all the good I can, to the agricultural community particularly, I am prompted to express a few thoughts on subjects which are, I am sure, of interest to many of them, viz: the benefit of Peas as an article of manure, and the growing of Tobacco in Eastern Virginia.

I wrote a short communication for the Planter about twelve months since, advocating the five field system, and recommending a sixth field as a standing pasture. From the benefit I have received since the adoption of this system, I am led to declare myself a still warmer advocate of its merits. It has proved itself to me both an improving, and profitable course of rotation for the farmer. My plan is, never to sow wheat after corn, but to sow Peas on all corn land in the spring, (about the last of May or first of June;) and as soon as they put up three or four leaves, to dress them with a liberal supply of plaster, sowed broadcast.

I have never had an application of guano, a clover fallow, or a dressing of manure of any kind, to produce for me such remunerating crops of wheat as I have reaped after Pea fallow

In the year 1858, (well known as a particularly disastrous season to wheat,) I raised within a small fraction of fourteen bushels for every one seeded on Pea fallow,—whilst on my clover fallow I made but eleven bushels and a fraction. My wheat sowed last fall on Pea fallow, is at present the most promising I have.

I have read many articles in different

papers in which objections are raised to the cultivation of Tobacco. I must beg leave to say that, in my opinion, they are futile and untenable. I will name two objections I have heard urged: 1st. The crop is too exhausting. 2d. It works your negroes too hard. Well, as to the first objection, I have only to say, that there must be a system about everything, and I think I can show satisfactorily that under the system I have adopted, it can be raised with as little deterioration to the soil as almost any other crop. My plan is this: Put your Tobacco on a part of the field that you intend for corn, do not put wheat after the Tobacco, but let the land go in Peas the following spring with the corn land, and I am almost confident your land will not be injured by the Tobacco crop any more than by any other.

As regards the latter objection, viz: "It works your negroes too hard," I do not see any good reason that can be given for such an objection. Can you not work your negroes too hard about any other crop? Why, certainly. We are the superior race and endowed with stronger reasoning faculties. Slavery is a blessing. Slaves are human, and they should be treated as such creatures. They ought not to be overworked. It is inhuman and unchristian thus to treat them. I do believe that, *en masse*, if you wish your negroes to treat you well, you should treat them likewise. What man of any heart could work a slave and not feed and clothe that slave well? My motto is, "work in reason, feed and clothe well, and thrash if they don't behave."

Mr. Editor, I have digressed; however, before concluding, I make this prediction: that in ten years from this day, Eastern Virginia will be generally a Tobacco growing region. The crop pays better than any other, and judiciously managed will not impoverish, as is believed by so many.

SUBSCRIBER.

Longwood, King Wm. Co., April, 1859.

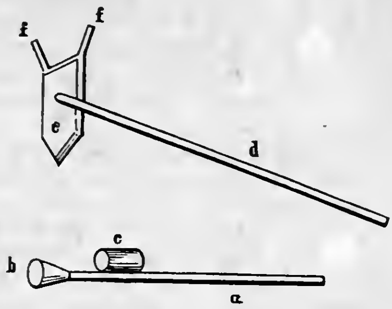
To Drive away Rats.

It is stated in the Boston Cultivator, that cotton sprinkled over with pulverized potash, will drive rats from premises infested by them, if crowded into their holes.

The peach crop of New Jersey is likely to prove very large the present year.

For the Southern Planter.

The Poor Man's Turnip Drill.



Take a hollow reed or elder stalk (*a*) three feet long, and the size of a stout cane. Attach to the top a funnel of tin or pasteboard four inches broad, (*b*), and an old tin cup at the side (*c*) six inches below the top, to hold the seed. To open and cover the rows, make an implement of wood thus: Take an old hoe helve, (*d*), and fasten to the end of it as a hoe a piece of oak plank 1¼ inch thick, 12 inches long, and 5 inches broad, (*e*); sharpen one end, to make a slight furrow by dragging after you as you walk, and arm the other end with two little wings or shares, (*ff*), of hoop iron, which will cover the furrow again as the implement is dragged after you inverted, and will leave the row exactly that convex shape produced by the best patent drills.

To plant a row and complete it with these implements, requires walking over it gently three times,—once to open, once to drop the seed, and once to cover. A handy person may plant and cover one acre a day of nicely prepared ground. Try it.

The reason of the thing is this: in dropping small seeds by hand alone, *you must stoop down*, else the winds will blow the light seeps out of the furrow, or even the divergence caused by the seeds moving against each other, and the fingers scatters them all awry. But it is this *stooping down* which kills you up. Your back aches, and in consequence of the discomfort and nervousness produced, your very fingers refuse to do their office nimbly, in distributing the seeds.

Now, the hollow drilling staff, when held with the left hand, (grasping it just below the tin cup,) enables you to walk pleasantly along upright, while the fingers of the right hand easily roll the seeds in a little stream into the funnel; and the time required by the seeds in running down the tube aids to distribute them more regularly. If your fingers work tolerably well, you will see the seeds roll out of the bottom of the tube almost as though it were done by machinery.

The same staff will sow clover, lucerne, timothy, parsnips, carrots, peas, &c., &c.

If my poor neighbours, whose operations, like my own, are not extensive enough to justify them in buying a costly seed-drill, will try this, they shall pay nothing for the invention. And as every one can make the implements for himself, he has a convenient drill without cost.

COUNTRY PARSON.

For the Southern Planter.

Terra Culture.

LOUDOUN COUNTY, VA.,
4th month, 21st, 1859.

J. E. WILLIAMS:

About two months ago, the farmers of this county had an opportunity of hearing Russel Comstock, of Dutchess county, N. Y., lecture on his favourite science of "Terra Culture," as he calls it. He professes to have discovered a system which consists in observing and following the laws of nature, by which the agriculturist may, with the same labour and with the same manure, increase his productions at least fifteen per cent.; and this system, he maintains, would, if steadily followed, prove a specific against the decay and unproductiveness of fruit trees, and also insure a healthy growth of vegetation, so that the depredations of insects would do little or no injury. This desirable information he offers to disclose to the farmers, for their special benefit, for and in consideration of the sum of two dollars to be paid him for every male, and one dollar for every female, at the same time requiring the execution of a written contract, pledging their honour not to disclose, under any circumstances, the secrets to any except those who have heard the same.

He even refused to allow a man to make the disclosure to his own wife. This does not seem like considering them as one. Perhaps we may account for this from the fact, that in his own case, he could not make himself and his wife so far appear one as to live together and perform the duties of man and wife to each other, they having separated; and he might suppose the wife in such case would not hesitate to disclose her husband's secrets. He attempts, however, to pass for a bachelor where he is not known.

Having seen some accounts of his antecedents from Northern agricultural works, and believing the whole thing to be a grand humbug, I opposed him in print in this county, as well as verbally, and he made but little progress here. He was, however, more successful in neighbouring counties where he was not known; and I hear he is is making his way South in this State, in Prince William and Culpeper counties. The agricultural press should expose his pretensions.

In 1851 he petitioned the New York Legislature for compensation, to induce him to make a public disclosure of his system—so called, but the bill did not pass. The New York State Agricultural Society in the same year, appointed a committee of five of its most intelligent members to confer with him and report whether, in their judgment, the subject was of such importance as to justify that Society in recommending to the legislature the propriety of paying him any amount for making a public disclosure. Four of the members of that committee (the other not acting) did confer with him and heard his disclosures, and unanimously reported "that there was nothing new in them, that, however good in themselves, they could be found in agricultural and horticultural works of the present day, and therefore could not recommend that he be paid anything." This plain and positive testimony he denied here as having been made as represented, and stated that the members of that committee now are willing that he should be paid. The individual who made the report has been written to, and in answer says, emphatically, that, "the report was *unanimous*, and that he is not aware of any change of opinion since." Thus flatly contradicting Comstock's assertions. This has been obtained since he left.

One of his principal points is, the crown of the roots, or the place where the top and roots join at the surface of the ground. Here, he contends, is the seat of the life of the plant or tree, and that in replanting a tree it should not be set deeper than it grew before. This recommendation, however, is no new thing. He places great stress on the preservation of the tap root, or the first root that puts out in the germination of the seed, and attributes much of the injury done fruit trees in transplanting to its mutilation. He prefers to plant the seed of fruit trees where they are finally to grow, and pretends if that is done they will need no trimming in future, or but very little. He carries with him a parcel of dry small nursery trees, of different varieties of fruit, and explains his theory by pointing to a root, and saying, "that was dead, and I can tell the cause of its death! If it had been treated so and so, it would not have died! By Terra Culture the balance between roots and top is preserved, and both are healthy!"

Another point with him is shallow planting of seed. One half inch, he thinks, is deep enough for all seed. He takes his hearers out into wheat fields, and finding large, strong growing plants, where the seed had been covered shallow,—he calls that terra cultured, and finding a weak growing plant that had been buried deeply,—he calls that common culture.

For corn, he recommends preparing the ground well; shallow planting and cultivation afterwards to just keep the weeds and grass down, and not disturb the surface roots, exactly what our best farmers recommend. He has some very large ears of corn, and estimates from raising a few hills in his garden how much may be raised on an acre. In this way he takes the attention of persons who have never given the science of vegetable physiology any consideration, or looked into the process of growth; and for such he prepares certificates stating the advantages of the theory, and the value of this knowledge, and considering it discovered by him, they recommend him to others, —and he solicits and bores his hearers until they sign his certificates, and with these he makes his way to other neighbourhoods.

Few are willing to take the trouble of refuting him, and if they did in one place, he is gone somewhere else before it can be brought to bear upon him. He said here that my opposition had injured the farmers of this county thousands of dollars, and charged me with being actuated by the basest of motives. He has been opposed and carricatured by the agricultural press of the North, where he is well known, for some fifteen years, at times. A late number of the Rural New Yorker pictures a learned Professor of Terra Culture, with long beard and hair, and a cap on without brim, somewhat elevated and parting at top, but by reversing the picture shows the head of an ass grinning.

An intelligent friend of mine, who had never heard of him before, and being willing to gain all the information he could, heard him lecture in Maryland, and when he was done, plainly told him, "he had no secrets to keep; he knew all this long ago!" Another heard him in this county, and says, "he did not gain a single new idea!" Such humbuggery should be exposed, even if it should bring down upon our heads the charge of being "as ignorant as a gosling," as was done here. Pass him round.

YARDLEY TAYLOR.

Sombrero Guano.

ALEXANDRIA, May 14th, 1859.

Dear Sir,—We notice in your issue of May, a letter from Mr. S. T. Stuart upon the subject of Sombrero Guano, in which he states that his experiments with the article purchased from us, proved to *his* satisfaction that it was "almost worthless."

Believing that Mr. Stuart's object alone in making the communication was, as he states, to ascertain for himself as well "as the farming community, from actual experiment, the value of Phosphatic Guanoes now so generally recommended by dealers," and having as importers and dealers in the article, considered it *our duty* to obtain the information he desires *before "recommending"* the article to our agriculturists, we take great pleasure in enclosing to you copies of letters received by ourselves and others, from gentlemen of the highest respectability, residents of Virginia, the contents of which we "recommend" not only to Mr. Stuart, but also to the entire farming community, with the sincere desire that they may be the means of attracting greater attention to this really valuable fertilizer, which in our opinion is destined to take rank side by side with Peruvian Guano. * *

Your friends and serv'ts,

FOWLE & CO.

FAUQUIER, Co., December 21, 1858.

Messrs. FOWLE & Co.

Gentlemen,—I used Sombrero Guano on Corn last spring, and made excellent Corn. I mixed Sombrero Guano with Peruvian last fall and sowed for Wheat, which now looks equally as well as where the Peruvian was sown by itself, 250 lbs. to the acre.

Yours, respectfully,

K. E. COOMBS.

CUMBERLAND Co., VA., Nov. 25, 1858.

Mr. A. C. ELLIOTT.

Dear Sir,—The Sombrero Guano I got of you in 1857 was used on my wheat crop. I also used Peruvian Guano at the same time on same land and crop, and saw no difference in the result. The season was not good for wheat, *but I can say the Sombrero Guano alone produced equally as good a crop as the Peruvian alone.* I also experimented with the same guanos the present year on my tobacco crop. The Sombrero Guano, though used on the poorest land, produced equally as large a growth of tobacco as where the Peruvian was used, but the character of the tobacco was very different. The Sombrero Guano produced a green colored, rich, heavy tobacco, and the Peruvian Guano, a thin, delicate yellow tobacco, with much less substance in it. I observe that the grass, where I used the Sombrero on wheat, is much more luxuriant, and afforded much better pasturage last summer than where the Peruvian was used. I shall use Sombrero Guano more extensively another year, and on my other crops as well as wheat and tobacco.

Respectfully,

FRANCIS ANDERSON.

CUMBELAND COUNTY, VA.

Being requested to furnish a statement of my experience in the use of Sombrero Guano, I offer the following certificate.

Learning that this article was utterly destitute of putrescent manure, I used none of it alone, but mixed one part of it with two parts of Peruvian Guano on my last year's crop of tobacco. This mixture was applied when the tobacco was worked the first time. The improvement in the crop, immediately after its application, was most manifest, and especially its superiority over some of the crop on which Peruvian Guano, without any of the Sombrero had been applied. The result was, that I made the best crop I ever made, and the best for the land that I ever saw. These considerations have brought me to the conclusion that the application of Sombrero Guano is the cheapest mode of applying phosphate of lime to our lands—an article so necessary to their high production. Holding this opinion, I certainly expect to use it again. The depredations of the joint worm on wheat have deterred me from wasting guano of any kind on that crop, and I sow but little wheat. I will only state further, that I have no confidence in making tobacco of high quality without the free use of domestic putrescent manures.

Given under my hand, the 19th January, 1859. W. S. MORTON.

BROOKHILL SCHOOL, VA. (near Charlottesville, October 6, 1858.

Dear Sirs,—I will thank you to send me one ton of ground plaster, and one ton of Sombrero Guano, with a bill.

I will take this opportunity to make amends for an injustice which I now think I did the "Sombrero Guano" last summer. My crop of tobacco just housed, was part of it, planted with that Guano—say four acres, with one ton—about 500 lbs. per acre, in the drill—the hills made upon it. My overseer and I were both entirely incredulous, and I joined in expressing my distrust of its virtues at Mr. F. Minor's, when Mr. Edmond was there. To my great surprise, just before cutting Tobacco, I noticed a wonderful difference in a portion of the crop, and inquiring of the overseer, he showed his marks, defining the ground where he had applied the Sombrero Guano. We, and others, judged that it was from ¼ to ⅓ better than the crop on adjoining ground of equal quality. The tobacco seems to be heavier and greener, stronger and of finer quality.

Respectfully, CHAS. MINOR.

To Messrs. Edmund & Davenport,
Richmond, Va.

CUMBERLAND CITY, VA., Oct. 10, 1858.

Mr. ANDREW C. ELLIOTT.

Dear Sir,—It gives me much pleasure to inform you that, notwithstanding we have had a very dry and unseasonable year to test it, the Sombrero Guano I got from you last spring comes fully up to my expectations. Below I give the result of my experiments.

I applied Sombrero *alone* and Peruvian Guano *alone* on oats, side by side, on same land, and saw no difference in result between the the two—both produced good crops. On my tobacco plant bed I applied Sombrero and Peruvian mixed, in the proportion of two-thirds *Sombrero* and one-third Peruvian. I sowed the seed on the 18th March, which you know, is very late in the season to sow tobacco seed, (December to middle of February being the usual time,) yet I was enabled to plant my crop as early as any of my neighbors. My plants were green colour, healthy and vigorous in the bed, and after transplanted in the hill, retained their green colour to an unusual degree for the dry season, throughout. When planted, I applied the guano, mixed as above, (say two thirds Sombrero and one-third Peruvian,) in the tobacco hills, in the proportion of about 300 to 400 lbs. to the acre, and the yield was twice as great where the guano was used as elsewhere on the same land, besides retaining a healthy color and vigorous growth during the season, far beyond any other portion of the field. I made similar experiments with corn, applied in the hill in the proportion of about 300 lbs. to the acre, with similar results and the same on vines. I also used the same on turnips, in the proportion of about 300 to 400 lbs. to the acre; and I venture to say, with one exception, I have the best turnip patch in the county, and that one, doubtless, owes its superiority over mine to the fact of its being sowed 25 days earlier than mine—it being sowed 8th August, and mine not till 2d. September. The manure used on my neighbors turnip patch was, I understand, a mixture of Peruvian Guano, stall manure and plaster, heavily applied.

I am clearly of the opinion that, if ground fine enough, Sombrero Guano needs neither Peruvian Guano, ammonia acids or stimulants in any form to render it perfectly soluble and useful to vegetation. Only reduce it to a perfect powder, and I believe it is of itself the best, cheapest, and most convenient fertilizer known. Yours, &c.,

HUGH RAINE.

CHANCE ISLAND, CAMPBELL CO., VA.
11th Nov. 1858.

MR. MOSES LACY.

Dear Sir,—I used the Sombrero Guano I purchased of you last fall, on my wheat crop, and also this spring on my corn crop. The result on both crops was good—far beyond my expectations when I bought it. I made better crops of both wheat and corn than any of my neighbors who used Peruvian Guano or other fertilizers on similar lands. The quality of my wheat was unusually good. *I used it alone and with plaster; I saw no perceptible difference.* I harrowed it in with my wheat, and also top-dressed it in spring;—quantity used, about 200 lbs. to the acre—applied in the hill with corn—say about 100 lbs. to the acre. I take pleasure in recommending it to the public as a *cheap* and valuable fertilizer.

Respectfully, JAMES C. WALTON.

LYNCHBURG, 10th Nov., 1858.

MR. A. C. ELLIOTT.

Dear Sir,—I used Sombrero Guano *alone* on my potato (Irish) crop this year with entire success. My faith was not strong enough in it to use it extensively, but having failed so often to raise potatoes on a certain piece of land that I thought rich enough to produce a crop without guano, concluded to try Sombrero Guano on it, and the result was not only a crop, but the best crop I ever saw on any land. I therefore attribute it entirely to the effects of Sombrero Guano.

M. LACY.

LYNCHBURG, Nov. 10th, 1858.

MR. MOSES LACY.

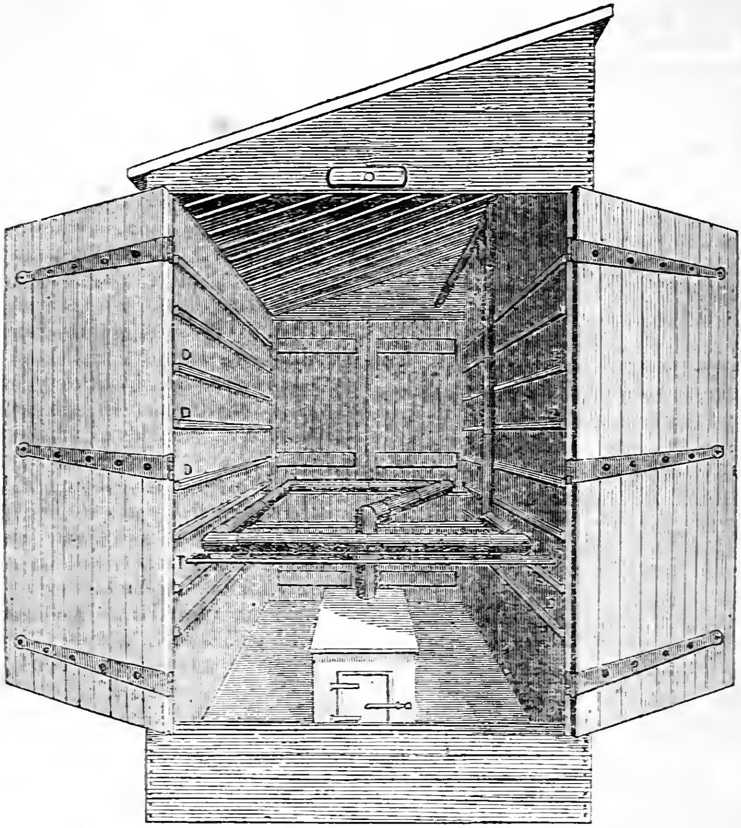
Dear Sir,—I used Sombrero Guano on a part of my crop of wheat last season with entire satisfaction, and I think it produced as well or better than the Peruvian Guano, used at the same time on same land, on wheat, side by side. I am fully satisfied in regard to the utility of Sombrero Guano, and have used it alone for this crop.

R. H. STATON.

Rotation of Crops.

In Beaver county, Pennsylvania, there is no established rotation of crops; yet, the best farmers endeavor to sow wheat on timothy, blue-grass, or clover sod, or on oat stubble, which has been cultivated with corn the previous year. They again sow on the wheat, in the fall, winter or spring, clover and timothy, the great object being to keep the field as long as possible in grass. In Berks county the system of rotation is, first, Indian corn and timothy or clover sward, followed the next season by oats.—*Patent Office Report.*

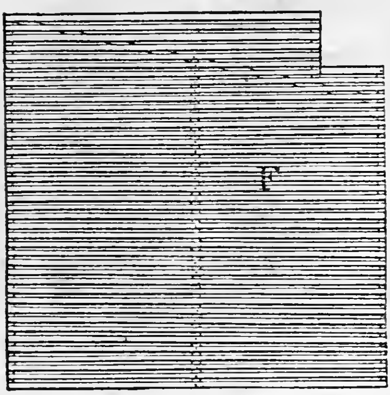
PLAN AND DESCRIPTION *Of a House for Drying Fruit, presented to the Virginia State Agricultural Society by* YARDLEY TAYLOR, *as a competitor for the Premium offered "for the best Kiln for Drying Fruit," to whom was awarded a Diploma or Certificate of Merit.*

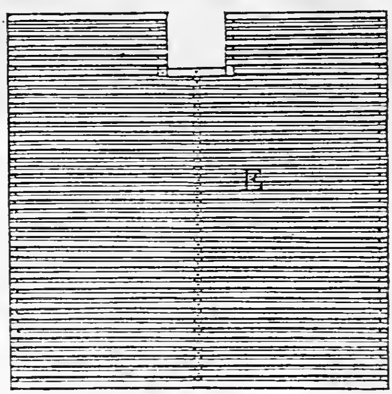


Supposing that the Society, in offering a premium "for the best Kiln for Drying Fruit," did not intend to confine itself strictly to a kiln, properly so called, in distinction from a drying house, or other artificial means, but that its object was rather, to obtain *the best mode of drying fruit;* I am induced to offer this description of a house which corresponds with the one I have had in use for several years, except that experience has suggested an improvement here introduced, which I propose to adopt with reference to the manner of coiling the stove pipe rather more about the house, whenever a season shall occur in which I may have a large crop of fruit to dry.

The dimensions of the house are 8 feet by 3 feet 10 inches in the clear, with a slope to the roof of 18 inches. Two pieces of scantling 4 inches square and 7½ feet long serve as the corner posts of one side of the house, and two 4 inch pieces 6 feet long answer the like purpose for the other side.—These posts are boarded up with inch planks tongued and grooved together. Set the two sides perfectly upright, 3 feet 10 inches apart as prescribed above, and nail strongly across the bottom ends of the posts at the back and front ends of the house boards 10 inches wide, to serve as door sills, and then four inches from the top of the *shorter* across at right angles to the *taller* posts on the opposite side, nail other planks at each end of the house, suitable to the purpose of headpieces for the doors. Then with tightly fitting folding doors close the entire openings at the back and front ends, as represented in the engraving.

A stove (a six plate one preferred) at least large enough to take in a stick of wood twenty inches long, or longer, should be so placed within the house that the pipe may rise in the middle. The end of the stove would then be near the front door, and in the most convenient position for putting in wood. Some persons have preferred to place the stove with one end passing through the side of the house, but this I think is objectionable on occount of the loss of heat. The stove should stand on the ground, and the first elbow of the pipe should be placed three feet six inches above the ground; then turn it horizontally and extend the pipe to the back end door, preserving the distance of nine inches from it, and also, from the wall of the house on the higher side; then turn the pipe along and across the back end door-way, extending it until it reaches within nine inches of the wall on the opposite side; then turn it along that side, extending it to the front door, then across that door-way to the opposite or higher side; then along that side to the point just opposite the upright part of the pipe where it first comes from the stove, being always careful to preserve the distance of nine inches between it and the sides and doors of the house; then turn the pipe upright to about the height of six feet; then conduct it nearly horizontally and carry it through the opening in the back and above the door as shown in the engraving. There should be three supports for the coiled pipe, one near each end door, and one near the middle, as at T in the engraving. These may be made of strong inch planks, three or four inches wide, well nailed to the sides of the house; there should be thin stone or slate resting on these supports for the pipe, to prevent them from taking fire. There should be ledges one inch square, made of strong plank and nailed on the sides six inches apart, as at D., to support the drying frames, which must be constructed to slide in and out freely. Two





of these ledges between the stove and the coil of pipe will be enough for the front end, more would be in the way of supplying the fuel to the stove—but there may be three of them at the other end, and three at each end above the coil of the pipe. The drying frames are made of inch plank, full inch wide, lapped together at the corners and nailed with lathing nails, with one piece across the middle nailed with large nails through the outside into the end of the cross piece, and then laths, such as are used for plastering, are nailed across on the bottom about one-fourth of an inch apart, or a little more—narrow laths are the best; then nail a lath along the bottom, across the ends to make the frames slide in and out smoothly. These frames should be of a sufficient length and width to fill the space provided for them, but so as not to prevent them from sliding in and out freely. The two lower ones at the front end should have an opening in them to allow the stove pipe to pass up from the stove without touching them, as represented in the figure marked E, and those above the coil of pipe at the same end must have an opening at the corner for the same purpose, as represented in the drawing F. The frames at the other, or opposite ends, may be made full, without any openings, as only one end comes in contact with the pipes.

The roof may be made of inch plank, the first board being nailed on the end so as to project over a little; then nail one far enough from the first to allow the second board to lap about two inches on each of the others, and so proceed until the whole length of the house is covered. By this mode an opening an inch wide will be secured at each end of the bottom planks composing the roof—an opening which is absolutely necessary to pass out the moist air which rises from the drying fruit, for if it is retained in the house the fruit will scarcely dry at all in the upper frames, however great the heat may be.

To dry peaches properly they should be brought in fully ripe, so that they may be opened with the fingers without a knife; they should be then laid—back downwards—on the frames, which may, for convenience, be placed on a stool or bench, the operator being seated, if he prefers it; and when the frame is full it is placed upon the ledges in the house. An adult person may handle the frames without help, but if the operator is younger, then two persons—one on each side—may handle them conveniently. The doors should be kept open as little as may be. When the fruit is partially dry, it is best to remove it from the centre, where it is hottest, to the edge of the frame next to the house where the continued operation of drying will progress more slowly, and to keep the centre constantly filled with fresh fruit to supply the place of that which has been removed. By attending closely to these directions, the fruit may be dried much faster than it otherwise would be. The fire should be kept up as brisk and as hot as it well can be without scorching the fruit. If the weather is fair and it is desired to expedite the business, the fruit may be taken out when about half or two-thirds dry and spread on a scaffold in the sunshine, but if no such motive exists, it is better to dry fully in the house and then pack away in some secure place before injurious insects can reach the fruit. It will be advantageous to have the fire renewed about midnight, as by deferring it until morning the house will get cool during the night, and considerable time will be lost in again raising the heat to the proper degree.

Clingstone peaches are best dried by taking out the stone, as we then get rid of them and have only the valuable part to take care of. The best way to rid them of the stone is to take a narrow sharp-pointed knife, and then holding the peach one side uppermost, with one hand, insert the knife with the other into the peach at the stem end and push the point of the knife to the middle of the upper side of the peach, then keep the point there and pass the knife around close to the stone and a ltttle below the middle of the peach on the outside—this will take off a little more than half of the flesh of the peach—then turn it over and insert the knife in the same manner on the other side—this will take off all the remaining flesh, except little at the middle of the sides and a little around the edge of the stone. Clingstone fruit may be dried with a hotter fire than freestones, as they merely dry away, without raising juice in the grooves of the stone, as freestone fruit will do under strong heat.—The quicker a peach is dried the better it is if not scorched. There is, however, little danger of scorching in a drying house like this, if proper care is taken to prevent it.—Clingstone peaches when thus dried are preferred by many, but they are more troublesome to dry. Many persons on the other hand prefer to have them pared before drying, but the difference is not as great as is supposed, inasmuch as to pare them successfully, they must not be fully ripe, (particularly if they are freestones,) and this want of maturity and consequent poor quality preserves the same bad flavor in the unripe fruit which existed before it was dried.—With strict attention one bushel of peaches may be dried in twenty-four hours, and if the scaffold is used—as has been suggested—a still larger quantity may be dried.

This house is also well adapted to the purpose of drying apples, pears, &c. They are much fairer than if dried in the sun. They do not require as high a degree of heat as peaches.

To build such a house, which any ordinary carpenter can do, will require about 650 feet of inch plank. It will require a stove and about twenty-eight feet of four inch pipe, with seven elbows to furnish it. Many persons have these articles on hand for winter use, which they do not need in summer; they can advantageously appropriate them to this purpose.

DESCRIPTION OF A KILN FOR DRYING FRUIT, MADE OF BRICK.

For many years previous to the building of my drying house, I used a kiln, built of brick, to dry peaches on. It was about 5 feet 6 inches wide, and about 14 feet long. First, there were three walls built, 9 inches thick, the whole length, and a wall across the farther end, these walls were raised about 1 foot high, and two arches were then made connecting them together the whole length except about 9 inches at the farther end; it was then built up and levelled off even with the top of the arches, upon this level place, rows of brick were laid from one end to the other, far enough apart to allow brick to reach from one row to another crosswise; it was then smoothly plastered over on the top, and the chimney was built over the mouth of the arches. The heat from the fire in the arches passed up through the opening at their farther end, into the small flues that ran lengthwise of the kiln, and the smoke then passed up the chimney. The advantage of this construction over other kilns that I have noticed is, that it is not so liable to burn as where the arches are thinner above the fire, and it will retain its heat much longer. With close attention, and renewing the fire at midnight, from 1½ to 2 bushels of fruit may be dried in 24 hours. But it takes perhaps four times as much wood as the drying house would need in the same time. Where there is a large quantity of fruit, and wood is not much of an object, it is an excellent kiln for drying. I have dried 30 bushels of fruit in one season with it.

The cost of building one, where all things have to be purchased, would be about as much as a drying house, as it would need a roof over it, and it would require about 1500 brick to build one of the size mentioned.

I prefer the drying house—there is less danger of scorching, and it answers better for drying other fruit, besides peaches.—Where there is a large quantity to dry, a second one may be built.

YARDLEY TAYLOR.

Summer Management of the Grape Vine.

EVERY one who has a garden has a grape vine; but not every one who has a grape vine knows how to manage it. We propose to say a few words on the subject for the benefit of our amatuer readers, especially as the season is now approaching when the vines will require their chief attention.

"How strangely you talk!" we fancy some of our friends exclaim; "the season is now approaching!—why, we thought winter was the time to prune grape vines!"

That is all very well; winter is, to some extent, the time to prune grape vines,—but the skill required to perform the operation at that season is not a tithe of what the grape vine expects of you in the way of *summer pruning.*

Did it never occur to the pruner how absurd was the idea of allowing a vine to produce a great amount of wood for the mere fun of cutting it away again in the winter? Can nothing be done to avoid this waste of wood,—this abuse of the productive energy of the plant? To a great extent it can, and that by the process called summer pruning.

First, let us consider why we prune at all. We plant vines partly for their shade and partly for their fruit. If left to grow as "doth to them seem best," two or three strong shoots will take the lead over the others, and go off like a rocket to the top of the house, arbor, or trellis, on which they may be trained. These powerful shoots, having once got the ascendency like other beings in the animal department of our planet, seem to strive to keep the others down; "the rich become richer, and the poor poorer," until, before many seasons are over the weak branches die away entirely and their assassins are left masters of the field.

Now, this is a very unsightly affair, to say nothing of its inconvenience. To have a vine for shade, that gives no shade, because we have allowed all the leafy shoots to congregate on the highest pinacle of their glory, is bad enough; but to have the luscious, tempting fruit so very far out of our reach besides, is enough to give them a very *foxy* character, though they might belong to one of the purest of the pure varieties of the genuine *Vitis vinifera* itself. From this we can learn *why* we want to prune. We want to balance the strength of the vine. We want to prevent the strongly inclined shoots from getting more than their share; and to do this we lay a sort of tariff on them, which somewhat shackles their weaker brethren to overtake and run evenly with them. Every part of a plant is thus brought under control. The trellis is fully clothed with foliage from top to bottom, and the lowest and humblest shoot in that vegetable commonwealth holds up its head as vigorously and independently as the most favored by nature, with a position at the top of them all.

And now for theory of protection. It is

necessary to explain to the reader that the more severely we prune a grape-vine shoot—or any shoot—in *winter* the *stronger* it will grow the next year. On the other hand, the more we prune it in *summer*, the *weaker*, in proportion it becomes. If we cut down a willow in winter, the next summer it will make a growth of five or ten feet; but if you cut it down after it is in leaf, it will throw out but a few weak shoots, or probably die altogether.

This seems very incomprehensible on the surface, but, with the help of Physiology, can be made very clear. For instance, as soon as the leaves fall in the autumn, the tree, in a certain sense, hybernates,—it needs no air,—it does not *breathe*. But as soon as growth commences, it must have all this. Like an animal, it lives by breathing; and to effect this, it puts forth leaves. It breathes through its leaves. They are, in fact, its *lungs*. The sap is, indeed, drawn into the plant by the roots just as food is taken into the system by the mouth of an animal,—and after being rough or crudely prepared in the tree is finished off by being passed through the leaves for contact with the air, precisely as blood is passed through the lungs of the more highly organized being. So it is clear that if the leaves be stripped off, we prevent the plants breathing; we injure its lungs, bring on a species of consumption, which will rapidly send the plant, if the practice be continued long, to an early and lamented grave.

We will suppose a vine two years old, and with a cane that at the last winter pruning has been left 8 feet long. From the eyes or buds on the top of the cane shoots will push, which in the fall will be perhaps half an inch in thickness, while those from the buds nearest the ground will probably be less than a quarter of an inch. This is Nature's way of working, which, in this instance, we must decidedly object to.

So, when the shoots from the top of the cane push, and have reached about three feet in length, we pinch off the strongest one to about four joints or leaves in length, the next strongest about five joints, the next six, and those we wish to strengthen, not at all. A few weeks later the shoots so pinched off will commence to push on again, but this time weaker than before. They will now have to be watched. If the last formed shoots seems to grow only as strong as the lowermost ones, so well; the object has been gained. If, on the contrary, it still pushes with greater vigor, stop it again, till it becomes what you wish it to be.

To get shoots *where* we want them, and *as* we want them, is the only object of summer pruning grape vines. Many other kinds of fruit trees, if they grow freely and vigorously, will not bear fruit. The wood-producing and the fruit-bearing principles seem antagonistic; and summer pruning of such free-growing trees, by weakening the wood-producing power of the tree, throws it sooner into bearing. The stronger and the healthier the wood can be grown this season, the finer will be the fruit the season following.

We are ranked amongst "the meekest, mildest mannered men," but how it angers us at times to pass a vigorous healthy vine in July, and to see some ugly bifurcated animal, in pants and shirt sleeves, tearing away at the young leaves and shoots of the plant without the shadow of a reason, with all the ardor of a delightful pastime, and till scarcely any foliage is left on the vine. *Ain't I admitting the sun and air freely through the plant in order to ripen its fruit? Without reason? Eh!* Softly, my misguided friend. It is not merely the sun and air that ripens your fruit. It is the office of the leaves to do that; and the finer and healthier the leaves of your vine, and the greater the amount of these healthy and vigorous leafy appendages, the better your fruit ripens, and the finer will it be in all respect. Have you never noticed how a vine rejoices when it can steal among the branches of a lofty tree far out of the reach of your exfoliating fingers? Did you never see how some uncared specimen, which never in its infancy had the advantage of an "expert" to care for it, and recommend some "warm and sunny" spot as the very place for its future welfare; did you never see how in that neglected shady spot, where the mid-day sun in vain could penetrate, and the life-giving rays of the morning sun broke in only in winter,—where

"Plants at whose name the verse seems loath,
Filled the place with a monstrous overgrowth,
All berried, and pulpy, and blistery, and blue,
And livid and starr'd, with a lurid hue,
Where agarics, and fungi, and mildew, and
mould,
Started like mist from the damp ground, cold;"

and yet where the plant seemed to revel in perpetual healthfulness,—the fruit to color to perfection, and the canes to live to a fabulous age and to attain to quite marvellous dimensions. And all this, not because of the shade *per se*, but because the thrip, and spider, and the myriads of insects that love to bask in the summer's sun; and the mildew, or blight, or *oidium*, or whatever you call it, that loves to spread itself where drought and moisture in the air, or extremes of heat and cold rapidly alternate, do not find a foothold.

The leaves—the leaves—take care of the leaves. Never remove for any other purpose than to weaken a strong-growing shoot. So shall your vine luxuriate and bear fruit, and afford you a grateful shade, free from most of the ills the grape vine is heir to; and if in its nature a spark of consciousness exist, that atom of mind will expand with a fervid warmth of gratitude to the writer of this article for saving it from the barbarous treatment it may have been heretofore subjected to.—*Gardener's Monthly.*

Horticulture and Mental Cultivation.

The love of cultivating gardens seems to be innate in man, and only requiring, where it seems to be absent, some small incentive to call it forth, with all its grandeur and holy influence. It is the primeval occupation, and taught our first parents love to the Deity and each other, in the umbrageous shades of the pristine Paradise. It is the natural associate of a cultivated mind; and strange to say, some of the most beautiful pastorals and rural poesy in the English language have been written by men who lived in London, and who derived their inspiration from house-sparrows and bricks and mortar, thus showing that with the cultivation of the mind—the approach to the pure Adamic intellect—came the yearning for the flowers of the garden and the evergreens of the shrubbery. It is also illustrated on our own continent by the dwelling-places of our great minds. We expect to find the giant intellects of the age at the centres of learning, deep in the massive study, and surrounded by the apparatus of collegiate information. To a certain period they are there, bnt how soon Irving buries himself with nature only, at Sunnyside; and Emerson, the philosopher, flies to quiet Concord, to contemplate, amid trees and flowers, the abstract truths that he evolves.

All nations, at all times, have acknowledged the value of horticulture as a humanizer and civilizer, just as cultivation of intellect calls for associate cultivation of flowers and plants. The one induces the other. An anecdote will prove this.

When the Rev. Mr. Boyd was appointed rector of Skipton Parish, in Yorkshire, England, he found a rude, unrefined, and, to a considerable extent, immoral population. The first step he took towards their amelioration was to lay out and plant a beautiful flower-garden attached to the rectory, to which he gave free access to his parishioners at all times. He afterwards encouraged some of them to ornament the gardens attached to their cottages by giving them plants and seeds; and in the course of a very few years this rude population was, by the kindly influences of horticulture and floriculture, transformed into a most orderly, gentle, and refined community.

This may be called a novel way of preaching the gospel, but it is a good and practical one, and we look to some such result as this from our own Central Park. Philadelphia finds it in her squares and fountains; Boston in her common; New Haven in her elms; and other cities should depend more than they do upon trees, flowers, shrubs and evergreens for the extinction of rowdyism, and less upon an uncertain punishment of offenders.

The benevolent ladies of our own city are beginning to appreciate the value of horticulture as a female employment, and are about to establish a horticultural school for females upon Long Island, where poor orphan girls may be taught gardening as an art. In after years those girls, saved as they will have been, from the vicious influences of a large city, and having a stock of robust health and an occupation that will keep their body and mind in active and pleasant exercise, will thank the lady, Mrs. Phelps, who founded it, more by the grand work they shall achieve, than by mere empty words.

It is a healthy sign of the onward intellectual march of the race, that gardening, as a business, and by amateurs, is becoming more and more extended, and that the army of civilization is looking with love and fondness at the trees and flowers, the leaves and grass, the blossom and the fruits, that are found with successive beauty upon the way-sides of its track through the ages.—*Scientific American.*

From the Louisville Journal.

New Plan of Drying Peaches.

Messrs. Editors:

As the *furze* which covers the peach is very objectionable in drying them with it on, and as peeling them for drying is a tedious process, and causes the loss of much of the sweetest and best parts of the fruit, a plan which will obviate both of these objections, and give us the dried fruit as good as if peeled, and in fact even better, is a desideratum, the supplying of which would be very acceptable to all who are in the habit of drying this most excellent and desirable fruit for table use. A lady friend of the writer has found it out and communicated it to him, and he will here describe it. Make a tolerably strong *lye* with wood ashes by boiling them in water—letting it stand after being boiled sufficiently, until the ashes settle to the bottom, when pour off the lye. Then put the peaches to be dried in this, *warm*, but not hot enough to cook them any; and rub them in it awhile. Then take them out and wash them in clear, cold water. This process will take all the furze entirely off, and leave them as slick and smooth as nectarines, with nothing but a thin skin on them. Then cut off and dry as usual. Peaches dried in this way will be found to be very sweet, and have all the advantages of not losing any by the usual process of peeling—as the sweetest part of fruit is generally that next the peeling. We have eaten pastry made with such peaches, and can speak from experience.

J. R. H.

Uses of Lime in Gardening.

BY WM. BRIGHT, LOGAN NURSERY, PHILA.

Of all the mineral and earthly substances employed in agriculture and gardening, there is not one, probably, about which there exists, in the minds of most persons, more doubt and uncertainty as to its real value and action, than in respect to the simple article *Lime.* Some farmers and gardeners think very highly of it, and use it constantly; others use it rarely, or discard it altogether. The most elaborate papers on the uses of Lime, (such as that in Johnston's Chemistry, for instance,) fail to enlighten the most intelligent readers as to the true nature and action of it upon soils and plants; and the most contradictory statements are constantly being published, in Agricultural journals, as to the practical effects of liming land.

The truth is, that while some of the most important uses of lime are overlooked, too much is expected of it, by many who employ it. Farmers and gardeners are nearly all apt to look too much to one substance as a fertilizer. One thinks he can do every thing with lime; another bases all his hopes of success on plaster; a third will have nothing but rotted sod, while a fourth thinks a grand panacea is to be found in guano. No error is more fatal to success than this one-idea notion. Lime is a very important auxiliary to other manures. It is in more ways than one a real fertilizer, and it *produces*, sets free and organizes fertilizing qualities in other matters; but it is by no means a universal manure or fertilizer.

To make a long story short, I propose to set down, in a series of paragraphs, the most evident and important uses of lime in gardening, and to call attention especially to two actions which it possesses, which are not very generally recognized or understood.

1. Lime is an alkaline earth, (a sort of salt,) and its first and most evident use is to *sweeten sour soil.*

2. Lime furnishes a substance which is present in considerable quantities in the ash of nearly all our cultivated plants and fruits. For this reason, partly, lime is specially useful to potatoes. The tuber of the potato shows but a trace of lime in a ton, and hence, some writers have hastily concluded, that lime, in quantity, is not essential to this crop. But look at the analysis of the straw or tops: there your will find nearly three hundred pounds in the product of an acre.

3. Freshly slacked, or caustic lime, acts as a *powerful decomposing agent,* when in contact with masses of earth or vegetable matter, setting free many substances which before existed in forms insoluble in water, and causing the natural decay of organic bodies to be hastened.

4. Lime causes cold, dense soils, to become more open and porous, and renders light sandy soils more close in texture, or more adhesive. These last are facts very generally understood.

5. Vegetable matter (that is loam, sods, stable-manure and straw) is the food of lime.

By its decomposing power, it may almost literally be said to eat up vegetable matter and loam. It effectuallly decomposes and drives vegetable matter and manure out of the soil, when in the caustic state. Hence, where there is little loam, there lime should be used sparingly.

6. Not only does lime decompose vegetable matter, but when used in excess it renders the results of decomposition *insoluble* in water. This is an important point. We have not space to elucidate it. But we state the fact, that lime not only decomposes, and renders soluble matter, but in excess, it renders the results of decomposition *insoluble.*

7. Lime, in close proximity with decaying nitrogeneous matters in the soil, (as horse manure, hair, leather, etc.,) becomes a real ammonia-producing agent; as it is a well-known fact, that lime and nitrogen, under such circumstances, unite to form Nitrate of Lime, fully equal to ammonia as a fertilizing agent, while potash and nitrogen form Nitrate of Potash, (salt petre,) the money-value of which as manure, needs no explanation.

8. Lime, when it has been burned and slacked, and again becomes mild, (or is changed into the form of carbonate,) is then a store-house of Corbonic Acid for the use of plants, and in a certain degree, has the same action upon vegetation as Carbonic Acid evolved from decaying vegetable matter. You will ask, how is this carbonic acid set free? I answer, in one instance, by the action of Carbonate of Lime upon silica or sand (which is chiefly an acid,) Silicic Acid is liberated, which in its turn acts upon the Carbonate of Lime, and large quantities of Carbonic Acid are let loose. Other changes, of a similar character, take place in the soil, caused by the actions and reactions of acids and alkalies, which result in the liberation of Carbonic Acid, held in combination by lime and thus it serves, in a measure, the same purpose as vegetable carbon, in its relation to plants.

The last two sections (7 and 8,) are those to which I wish to direct the attention of the reader, as they describe the least known and most important uses of lime.

My rule is to use lime, in the garden, constantly, but moderately; and especially to use it in combination with hair, leather and any slowly rotting nitrogenous matter;—and thus I secure two or three important points in "terre culture."

Gardner's Monthly.

Special Report of the Superintendent of the Virginia Military Institute, on Scientific Education in Europe.

We are indebted to the Superintendent, Col. Smith, for a copy of the report above referred to, which is comprised in a pamphlet of seventy pages octavo. The circumstances which gave rise to it, are briefly expressed in the following extract from the letter of Col. Philip St. George Cocke, President of the Institute, transmitting the report to the Governor of Virginia: "The Board of Visitors were induced to grant a leave of absence, during the last year, to Col. Smith, the Superintendent, to enable him to travel in Europe, for the double purpose of recruiting his health and strength, materially impaired by protracted official labors, and of examining the various institutions of learning as well as the systems of education in Europe, with the view of enabling the Board, in co-operation with the enlightened observation and extended experience of the Superintendent, *to give such direction and development to the system of education peculiar to the institute, as should best adapt that system to the growing wants and requirements of the times and of the country, and thereby insure, as the results of it, the highest degree of efficiency and of public usefulness.*"

The object of visiting "the various seminaries of learning and other institutions of education in Europe, with a view to ascertain the operations and success of the various systems of education which exist there, and *to inquire into the interests which are covered in the operations of the Military Institute of the State of Virginia,*" with which he was charged by the instruction of the Board, was pursued by Col. Smith, with untiring energy and indomitable perseverance. Through the characteristic courtesy and kind interposition of Judge Mason, our Minister to France, he obtained from the proper government official, letters of authority to visit the Polytecnic School at Paris, the General Military School at St. Cyr, and the Artillery and Engineer School of Application at Metz.

As his tour extended through England, Scotland, and Ireland, France, Belgium, the German States, including Prussia, Austria, Bavaria, and Wurtemburg, as well as Switzerland and Italy, his examinations were necessarily limited to some only, of the chief establishments of Europe. He was, nevertheless, enabled to gain a large amount of valuable and practical information in relation to the particular object of his inquiries, which will enable him in co-operation with the Board, to give such elasticity and expansion to the system and scope of instruction pursued at the Institute, as shall adapt it to the *wants* of the country from time to time, as those wants shall be successively developed. We are happy to see that provision for agricultural instruction is already felt to be an *existing necessity*. We therefore hope very soon to find the institution adapting itself in this particular, to "the requirement of the times." We annex the entire report of Maj. Gilham, made to the Superintendent, and submitted along with his own report to the President of the Institute, following it with Col. Smith's account of the Agricultural School of Germany, at Hohenheim, to which Major G. refers.

MAJ. GILHAM'S REPORT.

Virginia Military Institute,
January 8th, 1859.

Col. F. H. Smith, *Sup. V. M. I.*

Sir—The course of instruction in this institution is mainly of a scientific and practical character, wisely designed by the board of visitors to fit young men for the practical pursuits of life. Agriculture is the leading occupation of the people of Virginia, and of the south; that one upon which depend all other pursuits, and which affects the prosperity of even the state itself. A large majority of the young men committed to our care, are the sons of farmers, many of whom leave our walls to take charge of farms, while many others sooner or later, become tillers of the soil; therefore, it appears reasonable that provision should be made for agricultural instruction. Having given not a little time to the consideration of agricultural education, and having satisfied myself of its great importance, and of the practicability of introducing a thorough course in this institution, I beg leave to submit my views upon the subject, and to request that you lay this communication before the board of visitors at its next meeting.

Almost every where, at the present time, the prevailing sentiment is in favor of agricultural colleges and schools, and such a sentiment is quite prevalent in Virginia and the other Southern States. There are those, however, who, decrying every thing which is not "practical," cry out against "book farming," without thinking that perhaps the young farmer might derive something of the same sort of benefit from a *professional* education suited to his wants, as the lawyer, the divine or the medical man does from his. There can, I think, be no reasonable doubt that agricultural schools, if properly organized, would accomplish great good; and I shall take but little time in any argument to demonstrate this. Engineering is eminently a practical pursuit. The engineer may and generally does commence as an humble assistant, and gradually works up into the higher walks of the profession; and yet it is universally assumed that the engineer, if he hopes to master his profession in all its details, must, before entering upon it, be thoroughly grounded in all the arts and sciences upon which engineering depends. In other words, his education must be more or less special—professional. Agriculture, while a practical pursuit, is not a whit more so than engineering. Schools for engineers are considered necessities, and are patronized. Why, it may be asked, are agricultural schools less necessary, or less likely to be sustained? If the farmer is to dignify and adorn his occupation, and at the same time keep pace with the age, should not his education have as much of a special bearing as that of the engineer?

The best argument in favor of the utility of agricultural schools, is to be found in the fact that but few years have elapsed since schools of this kind were very rare, almost untried, now they may be counted by the hundred, and their numbers are still increasing. In Europe, the agricultural school is no longer an experiment. It is, if we are to believe the reports which reach us, accomplishing great good. The most renowned and probably the model school, is that of Hohenheim, for an interesting account of which I am your debtor. The others most noted are at Cirencester in England, Gignon in France, Moglin in Prussia, and Gorey Goretsh in Russia. In 1850 President Hitchcock, of Amherst, Massachusetts, enumerated 350 agricultural institutions in Europe. Since that time they have greatly multiplied, so that it is estimated that at the present time their number is not far from 500; and by far the greater number of them are the creations of the last twenty years.

The agricultural college of Cirencester, England, is probably more nearly suited to our wants than any other. This institution has been in operation but a very few years, and is already doing efficient service, if we may be allowed to judge from the valuable contributions to scientific and practical agriculture which emanate from its faculty, and which are coming to us in almost every number of the Journal of the Royal Agricultural Society of England.

In our country, while very much has been said upon the subject, very little has yet been done towards the organization of agricultural colleges and schools. A commencement has been made, however; several agricultural colleges have been organized; and we may hope that schools of this kind, suited to our wants, will multiply with the same rapidity that they have in Europe.

While there appears to be but little diversity of opinion in relation to the utility of agricultural schools, there seems to be no little difference of sentiment as to what range of subjects a course of agricultural instruction should embrace, and the manner in which instruction should be imparted. Almost all of the institutions yet organized are located on farms provided for the purpose. Very much of the instruction is of a purely practical nature—the field taking the place of the lecture room, and the students being required to take part, not so much in the management as in the manual labors of the farm. Such a system may be very efficient in the education of young men for managers, stewards, &c., as most of the agricultural schools are designed for, but I cannot think that it would meet with favor in Virginia, or the other Southern States, or that it is desirable it should.

The young men of the South who would seek the benefits of an agricultural education, belong for the most part to that class who have means, who would, if not taking a special course, take the ordinary collegiate course of the country, and so soon as their education was completed, enter into the possession of their estates, to direct all farm operations, establish rules for the government of servants, &c., for themselves. Our first efforts, therefore, should be to establish such schools as would be required for the education of the proprietors of the landed estates of the country—men who stand in the same position, socially and politically, as the members of the bar or of the medical profession. This being the case, it is not to be expected that we can find in any existing school a model for our guidance; nor indeed is such a model necessary. We live under peculiar conditions and must organize schools suited to our peculiar wants.

Our agricultural system is peculiar, and must be so, as it is modified in very many of its details by the institution of domestic slavery. All or nearly all farm labor is performed by the slave. The master must direct him, or have him directed in nearly all that he does. Law and the common dictates of humanity impose important duties upon the master—at the same time that his own interests demand that the labors of the slave, while they are not too severe, should be constant and productive. The farmer in a free state, who requires labor, hires it when he wants it, and of such a character as he may most need. When no longer needed, or when not suited to his wants, his hands are discharged, and he obtains a new supply, or waits until the changing seasons bring around the period for more active labors. The southern farmer, however, having the slave from the cradle to the grave, must support him in unproductive youth, and in advanced age, and must so direct his labors when he is an efficient laborer, that no time shall be lost. In season and out of season, the master must find profitable employment for him. Added to this, there are moral responsibilities resting upon the master, which cannot be shaken off, or transferred to another—responsibilities which are unknown in free society.

Again: The productions of our climate differ in many respects from those of Europe, or even our own Northern States; and consequently, while the great principles of agriculture are the same every where, our system is materially modified on this account, and our instructions should be in accordance with this modified system.

We need, in the first place, a school of the highest order—one in which the young farmer may acquire as complete an education, suited to his wants as a professional man, as the lawyer and physician do in theirs, respectively. If we are to advance in agriculture, we must put it upon the same ground, educationally, that the professions, or I may say, the other professions occupy. Our young men must be taught to feel that there is in agriculture as much to call forth all the energies of the mind, as in any other pursuit whatsoever; and in educating them for it, the course of instruction should be so framed as to give the mind full expansion in that direction.

But while the farmer's education should be for a special object, and consequently take a special or professional turn, it should not be too technical. He is in a position to exert a commanding influence, and owes certain duties to society, which can be better discharged by his having a knowledge of many of the more important branches which constitute a part of the ordinary collegiate course. We may give young men the college course, to be followed by one purely professional, or we may so arrange a course of instruction for four years, as to include the special in the general one. By the latter arrangement, the student would master the principles of his profession, while he was also acquiring those branches which are deemed necessary to every educated man. In the existing state of public sentiment in our country, there can be no doubt that the latter plan is the one best calculated to insure the desired object. The benefits likely to result from the introduction of agricultural schools, must be more apparent to the great mass of our people, before parents will be willing to give their sons a complete collegiate course, to be followed by an agricultural one. To secure the latter, the two must be combined, and this I propose shall be done by the organization of an agricultural department in this institution.

Our young farmers should be so educated, that they may with efficiency and skill direct the labors of others, rather than for the performance of manual labor themselves. We want scientific farmers—not mere laborers. We should aim to teach the principles upon which the plough is constructed—its various forms, uses, &c., rather than to make ploughmen. Not that I would entirely ignore practical instruction. On the contrary, I would make that a prominent feature. It is the very best means by which to illustrate important principles, and fix them to the mind. The agricultural student should have opportunities for becoming familiar with all of the operations of the farm; but it does not follow from that, that he should take any part in its actual labors. His office should be to *observe*, and receive instruction from those competent to give it, while the labors are going on, and not waste his time in the acquisition of a species of practical knowledge, that never could be of much service to him.

Again: While the student is acquiring those principles which are to guide him in his pursuit, he should be thoroughly imbued with the necessity for system, order and good government on the farm; to accomplish this, he should, in the efficient discipline of the school, have always before him an example at once of the necessity for, and the beneficial effects of good government. If he is educated to habits of order and subordination, we have the surest guarantee that he will, in after life, fully appreciate their importance, and be governed by their principles.

We come now to consider the special branches which should claim our attention in the education of young men for professional agriculturists. Our first aim should be to educate them in such manner that, when in the pursuit of their profession, they may be fully alive to the importance of observing accurately the phenomena of nature; and that they should be capable of classifying the observed phenomena, referring them to the principles upon which they depend, and of so reasoning upon them as to turn them to practical account. This can only be done by thoroughly grounding agricultural students in the principles of all the sciences which investigate the phenomena of agriculture, and by which its processes are conducted.

For example—the farmer meets with a great diversity of soils upon his farm, or he sees the soils of the region in which he lives are unlike those of another region. If he is familiar with the principles of chemistry and geology, he will not only know that these various soils had their origin in the rocks underlying them, but will be able to trace out the changes that have taken place in the rocks to produce them, and by simple observation may learn much, very much, of their composition, physical condition, probable requirements, &c. But if he is not familiar with the application of science to the explanation of agricultural phenomena, he may not know that the soil is formed from the rock which underlies it, or if his observation has taught him this important truth, it will be of no practical utility to him, for the reason that a knowledge of principles is necessary to correct reasoning upon the subject.

Again: By familiarity with the principles of science, the farmer will become an observer of, and turn to practical account, phenomena that might otherwise have entirely escaped his notice, even supposing him to be desirous of noting every thing worthy of attention. To use the example just cited, how many educated and enlightened farmers are there who have seen the rocks underlying their soils from their youth, without for once taking any account of the influence the former must have had in the formation of the latter, and simply because they know nothing of the application of geology to agriculture.

While the student was acquiring the principles of science applicable to his profession, the numerous details of practical agriculture should not be overlooked. This branch of the subject I leave to be discussed in another place. I do not wish it to be understood that by practical instruction I mean that any young man could be a thoroughly scientific and practical farmer, on the receipt of his diploma from the agricultural school. To promise any such thing would be preposterous. I would expect the professional education to do for the farmer what the medical school does for the physician, the law school does for the lawyer, or our national military school does for our officers.

The medical student is taught the principles of science upon which successful practice depends; he is taught what is regarded by the profession as the proper way to treat disease in all its forms; he is allowed to accompany his professors in their visitations to the hospitals, &c., in all of which he receives a large amount of practical instruction—and yet no one presumes him to be a finished medical practitioner when he receives his diploma. He has, however, such a foundation of scientific and practical knowledge, that when aided by diligence, experience and judgment, he may take a high stand in his profession. So in the agricultural school—we should expect to give the student such a course of theoretical and practical instruction, that when he enters upon the practice of his profession, his education may be of great assistance to him, enabling him to conduct his farm operations with greater skill, and consequently with greater profit to himself, at the same time that he would be setting a useful example to others, provided he, with diligence, energy and judgment, makes use of the knowledge acquired in the school, and of that which he acquires in the practice of his profession. His scientific and practical attainments can only be useful to himself and to others, if used aright.

I proceed now to enumerate the subjects which it seems to me it is more specially important to embrace in a complete course of agricultural instruction, without referring to those branches which belong in common to all liberal education.

1st. *Mathematics.*—It needs no argument to show the necessity for as complete a course of mathematics as is ordinarily taught in collegiate institutions. Besides the training of the mind to habits of correct reasoning, the student of scientific agriculture requires a knowledge of mathematics in the prosecution of his other studies; and in the practice of his profession, will almost daily stand in need of more or less mathematical knowledge.

Surveying, which is properly an application of mathematical principles, should be taught practically. The student should learn how to survey fields and farms accurately, &c. He should be able to use the level and the theodolite, and be familiar with leveling in all its details.

2d. *Natural Philosophy.*—This should embrace, 1st, a full course of mechanics; the laws of equilibrium, and motion of solids, the equilibrium and motion of fluids, &c.; the available power of steam, water, wind, the horse, and man; the application of principles to the various farm implements, machines, &c., should all be fully discussed. 2d. A less extensive one on *meteorology.* Under this head the importance of regular observations of atmospheric phenomena to the agriculturist should be shown; the instruments in use should be explained; the formation of clouds, rain, snow, dew, frost, &c.; the local and general causes which affect climate, the fall of rains, &c., should also be discussed. 3d. The effects of heat, light and electricity, as mechanical agents, should also receive attention.

3d. *Chemistry.*—So much has been said and written about the benefits to be conferred by chemistry upon agriculture, or by "agricultural" and analytical chemistry, that many persons have supposed, and not a few have taught that scientific agriculture was nothing but an application of chemistry. That chemistry has conferred, and will continue to confer important and lasting benefits upon agriculture, there is no doubt; but no one who is familiar with its principles, and has a proper appreciation of the requirements of scientific agriculture, could regard it in any other light, after all, than as *one* of a circle of sciences, all of which are necessary to agriculture as a whole.

The undue prominence which but a short while since was given to chemistry as the one science which could throw light upon the farmer's path, taken in connection with the fact that designing men have been systematically practicing upon the credulity of the public, and coupled with the additional fact that there are agricultural phenomena which chemistry has yet failed to elucidate, has led many at the present time to deny the utility of chemistry altogether, or to place too low an estimate upon its value to the farmer. When we reflect that in nearly all the processes of improvement of the soil, such as manuring, &c., in the germination of the seed, the growth of the plant, the formation of fruit, and the after conversion of vegetable into animal matter, although influenced by heat and light, the changes are all chemical, no one, it seems to me, could doubt the propriety of, or the necessity for the scientific farmer being familiar with the principles of chemistry, and its applications to the explanation of the phenomena which come under his observation.

This course should be taught by recitations from some well digested text-book, with occasional lectures from the professor. A laboratory should be fitted up for manipulation, in which the students should be required, under the direction of the professor, to manipulate for themselves; to prepare, study the properties, and test the various substances embraced in their course. Having had some experience in this method of teaching chemistry, I unhesitatingly recommend it over the old method of lectures and illustration by the professor.

But while I would thus render the chemical instruction practical, I wish it to be distinctly understood that I have no desire to make it appear that by this method I would expect to turn out "analytical chemists." The time given to the study of chemistry in any institution in our country, is, with a very few exceptions, too short to admit of a complete course of instruction in this branch of chemistry. Such instruction is not at all necessary. The farmer has to deal with *principles*. If, in the elucidation of these principles, he has occasion to call in the aid of analysis, let him go to the professional chemist; and if he is familiar with his subject, he can reason upon the results obtained by the chemist, as well as if he had obtained them for himself.

4th. *Mineralogy and Geology.*—The first of these sciences gives us a knowledge of the composition and properties of the individual minerals which are found in the soil, and in the rocks which underlie it, and if properly taught, the student will be enabled to reorganize all the more commonly occurring ones himself. The second, treating of the formation and history of mineral masses, or aggregated minerals, the origin of soils, the component parts of the various formations, the changes to which they have been subjected, &c., opens up a wide field of useful enquiry to the farmer.

These sciences, to be practically useful, should be taught practically, as in the case of chemistry. In mineralogy there is no difficulty, as the student might be required to examine and test each mineral until familiar with it in all its varieties. In geology, too, much can be done in the lecture room, by making the student familiar with the various rocks which compose the different formations, by causing him to study the characters of characteristic fossils, &c. But in order to make the instruction really practical, the student should have opportunities for studying the geology of the country around the institution, and of visiting interesting and instructive localities.

5th. *Natural History*—embracing botany and zoology. Under the head of botany, the course of instruction should include a complete outline of vegetable physiology, in which the offices performed by the roots, stem, bark, leaves, &c., should all be fully explained, and one of systematic botany, including separate descriptions of the various agricultural plants, and of the "blight," fungi, &c., which are hurtful to cultivated crops.

The course of instruction in zoology should embrace a complete outline of animal physiology, the division of the animal kingdom into four great groups, the subdivisions of the vertebrated, with a more particular account of the mammalia, including particular descriptions of the domestic animals, as the horse, the cow, the sheep, &c. Under the head of invertebrated animals, the habits, transformations, &c., of insects injurious to vegetation, should be discussed, with the particular descriptions of those which more commonly prey upon the various crops of our country.

6th. *Engineering and Architecture.*—The first I would limit to the consideration of the various building materials, their relative strength, durability, value, &c., and the various processes of cutting and felling, making embankments, draining, the construction of common roads, farm bridges, &c. The course of architecture should embrace its principles, together with its application to the construction of the various buildings required upon the farm, from the mansion of the proprietor to the most unimportant structure. Economy, health, comfort and utility, should be consulted in all cases. I would not expect the farmer, however, to take the place of the professional architect. On the contrary, the insight which he would get of the subject would be sufficient to show him the necessity for consulting the professional man in all important improvements.

Rural architecture has not received the attention in our country that it deserves. Our people need to have their natural tastes *educated* to a proper appreciation of its importance to a cultivated people; and I conceive of no better plan of effecting this, than by securing a general diffusion of correct principles in the way proposed.

7th. *Right-lined and Topographical Drawing.*—This instruction becomes necessary in connection with surveying, engineering and architecture.

8th. *Medical and Veterinary Practice.*—The application of science to the investigation of the causes of, and the means of cure of the diseases of domestic animals, is justly regarded as a necessary part of the education of the scientific farmer; and we accordingly find that in the best agricultural schools provision is made for instruction in veterinary medicine. A course of scientific agriculture would not be complete without it. The instruction in this subject should embrace the structure and anotomy of the domestic animals, their diseases, mode of treatment, &c.

If such instruction is necessary to the educated farmer, in order that he may take proper care of the various animals on his farm, how much more necessary is it that the southern farmer should have some knowledge of the human frame, the prevailing diseases of the region of country in which he lives, and the ordinary modes of treating them. He not only has the health of his immediate family to look to, but that of all his servants. On a large farm there must always be more or less sickness; and if no physician is on the place, there must be almost daily calls upon the master for medical advice. He must be something of a physician, in spite of himself.

In the education of the farmer, I would provide for instruction in human physiology and anatomy; the symptoms, &c., by which he may know various diseases—how to treat them; how the sick should be nursed, &c.

I would have it understood, however, that in proposing such a course of instruction, I have no idea of making a physician of the farmer. I would simply expect to qualify him for the better performance of the various duties which a proper care for his own interests, and a due regard for the welfare of his servants, impose upon him. He would be competent to the skillful treatment of all simple diseases—would know how the sick should be cared for, and would be sufficiently familiar with symptoms to know when he ought to call in the physician.

9th. *Science and Practice of Agriculture.* This course should embrace, 1st, the history of agriculture; the general objects of agriculture; and the application of the sciences of chemistry, geology, botany, &c., to agriculture. Under this head, the origin, nature and composition of soils; manures, their composition and value, sources of supply, application, &c.; the characters of the various agricultural plants, kitchen vegetables, fruit and forest trees, &c.; farm implements and machinery; the general effects of heat, light and electricity on vegetable growth, &c., &c., should all be fully discussed.

The course of practical agriculture should embrace all farm operations—such as plowing, harrowing, seeding, draining, harvesting, irrigation, rotation of crops, &c., &c.; the cultivation of the various crops; the management of land in pasture and meadow, soiling, &c.; the economy and management of slave labor; the different kinds and characters of live stock; principles of breeding, rearing, feeding and fattening of stock; the dairy, milk, butter and cheese; general principles to be observed in the erection of farm buildings, &c. The whole to conclude with instruction in keeping farm accounts, the laws of enclosure, laws of tenure, and the laws relating to the owning and hiring of slaves.

In order to give greater efficiency to the instruction in practical agriculture, a farm should be purchased, and provided with a dairy, necessary farm buildings, implements, machinery, &c. Horses, cattle, &c. should be reared upon it, and it should be systematically cultivated.

A small portion of the farm, say a few acres, should be set aside for experimental purposes, to test new process before applying them on a larger scale, or recommending them to the public. Another portion should be set apart for a fruit and vegetable garden, where the student would have opportunities for the study of horticulture, and where he could learn practically the various processes of grafting, budding, pruning, &c.; and another for a botanical garden, so as to enable the professor to illustrate the botany of agriculture to the fullest extent.

The students should have frequent opportunities for making themselves acquainted with the various operations of husbandry, and of becoming practically acquainted with the uses of the different implements. They should also in turn be put in charge of the different departments of the farm, such as the stables, reaping, threshing, &c.

Finally—In order to enable the professors in all the departments to illustrate the numerous applications of science to agriculture, an agricultural museum should be attached to the institution, in which should be found models of all approved agricultural implements and machines, and every kind of agricultural product, such as the different grains and grasses, every quality of tobacco, wool of every degree of fineness, models of fruit, vegetables, &c., &c., together with specimens of the various kinds of wood used for building, ornamental, and other purposes.

With this communication I transmit copies of the courses of instruction in the royal agricultural college of England, at Cirencester, and of the great school of Hohenheim in Prussia, from which it will be seen that the plan proposed agrees in its main features with that adopted in these schools. As you, sir, have lately visited and critically examined into the practical working of the Hohenheim school, I hope you will favor me, by transmitting to the board of visitors, with this report, some account of your observations, together with such suggestions as your visit to that school may have led you to believe would be valuable in this connection.

It only remains for me to show how we may engraft this course of instructions upon the institute course, so that any cadet who may desire it can avail himself of its advantages.

By reference to the course of instruction of the institute, as at present organized, it will be seen that provision is made for mathematics, natural philosophy, chemistry, mineralogy, geology, engineering, architecture and drawing; and that the time given to each of these subjects is sufficient, and in some cases more than sufficient, for all the requirements of the agricultural student. The only subjects, therefore, for which provision must be made, are, *natural history, medical and veterinary practice, and scientific and practical agriculture.*

The course of instruction of the institute is completed in four years, and is so arranged as to fill up the time completely, leaving no room for the introduction of new subjects. In order to obviate this difficulty, so as to secure ample time for the acquisition of the three branches mentioned above, I propose that at a given point in the course every cadet shall have the right of choosing whether he will take the agricultural course or the regular course. If he takes the former, his course from that time becomes modified; certain subjects, which to him as an agriculturist would be unimportant, should be omitted entirely, while others should be abridged or otherwise modified.

Thus the course of natural philosophy embraces, besides the mechanics, which is of great importance to the agricultural student, a full course of optics and astronomy. The whole of the optics might be omitted, as in no way necessary, while that of astronomy might be made more elementary. The instruction required in engineering would, as I have already shown, be very limited. The course of engineering, as now taught, is far more extensive than would be required, while that of architecture would want considerable alteration, and some extension. A portion of time might be saved in the department of drawing, and in some others. After a careful consideration of the subject, I feel assured that ample time might be secured for the agricultural course in all its details.

In order to provide full instruction for an agricultural class in the institute, it would be necessary to have at least one additional professor, a *professor of agriculture*, and to secure a farm in its immediate vicinity. To the professor of agriculture I would assign the departments of natural history, and scientific and practical agriculture, while the instruction in human physiology and anatomy, &c., and in veterinary medicine, might very well be entrusted to the surgeon of the institute.

In order that the board of visitors may see at a glance what the entire agricultural course would be, if the above recommendations were adopted, I present it in tabular form, giving the studies of each year, and the time devoted to every subject.

First Year.

Mathematics, daily, the entire session.
Geography, daily, from 1st September to 1st January.
English grammar, daily, from 1st September to 1st January.
French, daily, from 15th January to 1st July.
Latin, every other day, from 15th January to 1st July—alternating with drawing.

Second Year.

Mathematics, daily, the entire session.
French the same.
Latin, every other day—alternating with drawing.

Third Year.

Mathematics, daily, to 1st January.
Natural philosophy, daily, from 15th January to 1st July.
Chemistry, daily, from 1st September to 1st January, and from 15th Janury to 1st July, every other day—alternating with mineralogy and natural history.
Latin, daily.

Fourth Year.

Scientific and practical agriculture, daily, the entire session.
Rhetoric, logic, English literature, and constitutional law, daily, throughout the session.
Geology, every other day, from 1st September to 1st January—alternating with engineering and architecture.
Infantry and artillery tatics, every other day, from 15th January to 1st July—alternating with human physiology, &c., and verterinary practice.
Moral philosophy.

Thus it will be perceived that we have full time for the prosecution of all those studies which I have mentioned as necessary to the professional education of the farmer, without encroaching upon the time heretofore given to English, French, Latin, Rhetoric, English Literature, Constitutional Law, &c.—all of which are as necessary to the general education of the farmer as that of any other professional man; and by comparing this proposed course of instruction, and the time devoted to its acquisition, with that actually taught at Cirincester, or Hohenheim, it will be found to compare most favorably with either.

I am, colonel,
Very respectfully,
Your most ob't serv't,
WILLIAM GILHAM.

The great agricultural school of Germany is at Hohenheim, in Wurtemburg, six miles south of Stuttgard. Hohenheim (*High-Home*) was originally a *ducal palace*, which was transferred, on the coronation of the present king of Wurtemburg, to the uses of an agricultural school. The extensive ranges of court rooms, servants' rooms, halls, stables, &c., which constituted the arrangements of the royal residence, came in most admirably for the new uses to which they were applied. The public halls answered very well for the exhibition and instrumental rooms; the stables, for the cattle and sheep—while dormitories for 130 students were easily provided in the long ranges of the second floor. The school was unfortunately in vacation when I visited it, but I found one of the sub-officers there, who spoke French, and he, together with an intelligent student from Belgium, showed me every attention, and seemed pleased to afford me all the information at their command.

This school is a great scientific and practical school of agriculture. It is not a manual labor school, although any student is at liberty to labor if he choose. The basis of the school is careful instruction in scientific agriculture, embracing chemisty, geology, mineralogy, mechanics, physiology, animal as well as vegetable, and every thing belonging to the diseases of animals and stock. The principles thus taught in the class room are made the basis of the experimental instruction on the farm, for 1,000 acres of good arable land are attached to the school. Does science show that the application of a particular manure will be judicious—the experiment is made, and the results carefully noted, and this not slightly, but with patient and laborious care. When the result is fully established, it is proclaimed, and becomes the established rule for the farmer every where. Is the manufacture of *cheese* the subject before the class—the professor will deliver his lecture, explain the rationale of the process, and also the manipulations necessary; and while the lecture is in progress, the milk will have passed from its liquid state to that of pressed cheese. So that theoretic and applied science is so joined in the instruction here, that *Hohenheim* is regarded throughout Germany as *the* authority on agricultural matters, which determines all questions of policy in this branch of industry; and a knowledge of this fact makes the professors slow to express an opinion on any point, until conclusive evidence satisfies them which is the true answer. Thus, an enquiry was presented as to the relative economy in feeding 100 weight of hay to cattle or sheep, and the result was favorable to the latter in the proportion of some 20 per cent.

All new implements of agriculture are sent to Hohenheim for testing. The professor will explain to his class, before they are tried, the mechanical principles involved, their effect upon the draught of the animal, as founded upon his physiological structure; and then the test is made.

In Germany, oxen pull by the horns, the band passing in front of the head just below the roots of the horns. This is not an accidental arrangement, but reasons are given for it, founded upon the form and strength and durability of the animal.

The model rooms contained every variety of agricultural implements, among which I noticed with pride the reaper of our own *countryman, McCormick*. The implements which were not on hand for use in the field, were exhibited by most carefully constructed *models*. In the *seed*-room, every variety of seed and root was tastefully arranged; and these specimens are not exhibited merely to be looked at. Their peculiar properties are carefully unfolded by the lecturer, as he presents them to his class. My eye rested upon a fine specimen of a common potato. I took it up, and finding it much lighter in weight than a potato of its size should be, I enquired how it had been so carefully preserved. My guide laughed heartily at my question, and replied, that the specimen I held was a *model in wood*. And models in wood were shown, in like manner, of apples, cherries, &c., all of which would have equally deceived me, had not my attention been drawn to the model potato. In the same room were specimens of wool of every variety, carefully arranged by classification.

I was particularly interested in the hall of *forestry*. Here every variety of *wood* was seen in choice specimens, and classified, each class embracing those timbers which possessed distinct peculiarities: thus timbers which would bore without splitting; then those that might be turned; and also those that could be reduced to thin laminæ—all of which was very suggestive to me as presenting one important defect in our American education. With every variety of the noblest forest trees upon earth, so little attention is paid to their study, that our young men scarcely know the *names* of the trees as they pass them in the woods, much less their qualities and properties; and yet is there any part of agriculture so well deserving of attention as the culture, preservation and properties of our forest timber.

The cattle stables contained some 70 or 80 very fine cows of the *Swiss* breed, the calves from which were raised and sold for *labor*. They are never removed from their stalls except to water, twice each day; and their food is regulated by carefully tested experiments.

Some *twenty-five* mechanics are employed constantly at the school in making implements and models, which are sold.

The school is composed of the *academy* proper, and *institute*, or school of application. The charges of the first are about 30,000 florins (say $12,000) annually, and these are met by the tuition fees of the students. The expenses of the *institute* amount to 40,000 florins ($16,000), and the sales of stock, produce from the farm, and models, about equal the expenditure—so that, as nearly as I could ascertain, the school is *self-sustaining*.

The expenses to each student amount to about $300 a year, and this sum may be reduced by the student availing himself of the facilities for cheap boarding in the neighborhood. I found the school deficient in public documents. They had nothing except in *German*; and I was only able to get a couple of pamphlets in this language, giving a programme of the course of studies and discipline.

Prize Essay on the Temporal Advantages of the Sabbath.

A benevolent individual in England, "deeply impressed with the intimate connection between the preservation of the Sabbath and national morality, prosperity and order," "offered three prizes of £25, £15 and £10, for the three best Essays upon the Temporal Advantages of the Sabbath to the Laboring Classes, and the consequent importance of preserving its rest from the encroachments of unnecessary labor." The competition for these prizes was expressly limited "to the working classes themselves," and in response to the offer, more than a thousand Essays were received by the appointed adjudicators "within the short space of about three months." The first premium was awarded to the author of the Essay entitled, "*Heaven's Antidote to the Curse of Labor.*" The author who, be it remembered, is a journey-man printer—thoroughly discusses his subject in its various relations:—"The Physical, Mental, Intellectual, Domestic, Moral and Religious Advantages of the Sabbath." The treatise covers more than ninety pages,—a well-sustained effort of ability throughout. We transfer to our columns his views, as expressed on one branch of the general subject, namely:

THE DOMESTIC ADVANTAGES OF THE SABBATH [CONSIDERED IN RELATION TO THE WORKING CLASSES.]

Besides numerous incidental and collateral benefits resulting from the advent of the Sabbath, in relation to the homes of the working classes, there are three great ends directly promoted by it that are worthy of special regard: it favors the cultivation of natural affection, it secures family fellowship, and it generates and fosters domestic piety.

I. UNDER THE AUSPICES OF THE SABBATH NATURAL AFFECTION IS NURTURED AND INCREASED.

The institution of families does not owe its origin to human ingenuity. God himself has grouped the human race in these miniature associations, and, by the refined instincts which he has implanted in their bosom, has, in all ages, and amidst all the confused comminglings of mankind, preserved this unique institution from destruction. The homes of men are the centres of nearly all the light and warmth that cheer the social world; the arks that shelter mankind from the raging tumults and storms of life; the cells where the loving and the loved hoard the sweet fruits of their reciprocal affection; the well-springs that supply mankind with the purest draughts of earthly happiness. Attachment to home is always strongest in the hearts of the virtuous and the good, whilst it will be found, that those who have abandoned themselves to sensualism and vice, have first learned to loathe the quiet joys, the chaste delights, and the gentle affections of the family circle.

All our natural affections are quickened by frequent and kindly domestic communion. The offices of love, the acts of devotedness, and the proofs of tenderness, constantly repeated among relatives mingling in the same dwelling, cannot but powerfully affect their emotional nature, and continue to weave, day by day, a chain of love around their hearts. The strength of this chain will depend, in a great measure, upon the frequency or infrequency of the intercourse subsisting between the respective members of the household. It is proverbial that absence tends to the estrangement of the heart, even from those claiming the closest kinship with us. Where our seasons of communion, therefore, only occur at lengthened intervals, or where they are hurried and embarrassed by the intrusion of care and anxiety, the bonds linking together the members of the family must of necessity be thereby relaxed and weakened.

These observations bring at once to our view the position of the working classes, in their respective families, as it respects the cultivation of those natural affections from which so large a share of their earthly enjoyments spring. During the days of labor the artisan or the husbandman is, to a great extent, an involuntary absentee from his home. He rises early in the morning, before the remainder of the family are up, and goes forth like the sun, to perform his daily circuit of duty. If the scene of his operations happens to be near, he shows himself punctually at the hours of refreshment, partakes hastily of the family meals, and again disappears; but if, as is frequently the case, his sphere of labor be remote, then he returns no more to his fireside till the evening is far spent, and when the children, or the sick wife perhaps, have retired to rest, whilst in very many instances the great distance of his employment will detain him from the bosom of his family till the broad shadows of the closing week are stretched across the land. This is the perpetual lot of millions of our toiling tribes. What opportunities, then, have they, in these swift visits to the domestic hearth, or in the drowsiness of evening exhaustion, to breathe sympathy or minister comfort to an ailing and suffering wife? What opportunities to win, by parental endearments, a lodgment in the hearts of their offspring? What leisure to sit under the shadow of the gourd their own hands have planted, and eat of its delicious fruits? If some provision had not been made to obviate the effects of this domestic deprivation, the families of the working classes generally would present a painful spectacle of mutual indifference and disaffection between husbands and wives, and of alienation between fathers and children; for when the natural affections, which mainly give birth to all the delights of home, are suffered to languish through neglect, there are no evils or distractions to which such households may not become a prey.

But the same Benevolent Being who has, by certain constraining laws interwoven with our nature, clustered mankind in these little communities, has also, even in the most unpropitious circumstances, afforded facilities for promoting those refined instincts on the strength of which the happiness of the family institution chiefly depends. God has given to the sons of labor the Sabbath for a sacred possession. On this day the separations of the week do not take place; the dissociated are brought together into fellowship, the brother caresses the sister, the father lavishes his fondness upon the children, the husband tenderly greets the wife, and the zone of charity encompasses the household. The pulses of affection are quickened in every soul; each beholds his or her happiness imaged in the beaming countenances of all beside, and thus love ripens apace beneath the clear sunshine of the heart.

If the Sabbath fails to bring household harmony and interchanges of affection, as it does in too many cases, we must attribute it, not to any defectiveness in the provisions of the day, but to the prevalence of discordant passions in the bosoms of the members of the family. Their heart-strings are out of tune, consequently the music of domestic life is marred. The father is austere and despotic, it may be, or the mother is querulous and ill-tempered; in either case the green affections of childhood are blighted as soon as they appear. The husband is perhaps enslaved by intemperance, and robs his family to satiate his lusts; the down-trodden wife either upbraids him, or sullenly submits to her fate, and the slighted children learn to dread and recoil from their degraded sire. To such the Sabbath re-union brings no divine concord, no holy heart-communion, and thus ruthlessly does sin oftentimes blur the bright beauty of Sabbath homes, and neutralize the kind intents of him who is alike the founder of families and of Sabbath days.

II. THE SABBATH SECURES TO THE WORKING CLASSES OPPORTUNITIES FOR DOMESTIC FELLOWSHIP.

This is but an amplification of the idea upon which we have already dilated. During the week by far the largest portion of their time is consumed amidst their coadjutors in toil, many of whom are comparative strangers to them, others are unworthy of their confidence and friendship, whilst the fellowship of not a few is decidedly distasteful and distressing. It imparts a double joy, therefore, to the intelligent and virtuous man, to be able to escape for a season from such contacts, and to find a temporary retreat in the bosom of a cheerful family. Here he can breathe freely, in an atmosphere untainted by the impurities that have surrounded him throughout the week. Here he can solace his soul with the sweet converse of those he loves. On this day he has time to imprint, line by line, lineament by lineament, an indelible image of himself on the hearts of his sons and daughters. On this day he has leisure to extract the honey of domestic happiness from the beauteous flowers bursting and blooming around him in the garden of his home. On this day he has opportunity to cultivate the affections of his children, by directing them towards worthy objects; to admonish them of their faults and follies, to point out the temptations to which they are exposed, to forewarn them, with a parent's earnestness, of the perils that beset their steps, to impregnate their minds with sound principles, to instil virtuous sentiments, to extirpate vindictive dispositions, to encourage the exercise of the intellect, and strive to exalt the moral sense, in short, to weed out of their natures whatever would prove detrimental to their happiness or usefulness, and at the same time to foster in them whatever might tend to improve their characters, or give stability to their future lives.

If this parental mission, to which the Sabbath peculiarly calls the heads of households, were but conscientiously fulfilled, what myriads of youth might be snatched from infamy, and what numbers of sorrowful parents, whose heads are prematurely bending to the grave, might spend a happy and extended old age beneath the family vine they had planted in their days of strength. But, in the most critical periods of their children's history, their minds and morals were neglected—left exposed to the sower of every sort of evil—and now, alas! they are harvesting a terrible retribution in the crimes and sufferings of their scattered offspring!

Contrasted with this dark picture, how blessed is the retrospect of a well spent Sabbath in the family. What a sweet preparative for the struggles of the coming week! Where is the father who would not go forth on the Monday morning with a heart brimful of rapture to toil anew for his wife and children? And how often as the hot dews of labor roll from his forehead, and his weary arms drop pithless by his side, will the swift thoughts of home rush over him, reviving him like new wine, and quickening all his flagging energies? The exertions of such a man, acting under such abiding impulses, cannot be otherwise than fruitful; and how precious should such fruits be esteemed, when cast into the family lap for the impartial use of all!

It is equally cheering to the matronly wife to be privileged, for one day in seven, to entertain her lord in the peaceful realms wherein she lives and reigns. Exiled to a great extent from her presence in the week, she ardently longs for the day when her husband shall fill the vacant chair beside the hearth, irradiate the cottage with his smiles, and delight her ear with that voice whose tones of tenderness whispered away her heart in the romantic days of her maidenhood.

But, if the communion of a well-ordered home be thus refreshing to parents, it is difficult to overrate the hallowing influence it exerts upon the minds of the rising members of the family. It helps to consolidate the virtuous formations of their characters. It preserves the guileless and unsuspecting from the fatal seductions that bestrew the highways of the world. It restrains those prurient desires that so often burn in the bosoms of the young, to rush into the world and into the blighting excitement that rages out of doors, and teaches them betimes that real happiness may be imbibed at the quiet cistern of domestic enjoyments, but never from the turbid currents of a dissipated life.

And then, this influence is as lasting as it is beneficial. The recollections of a happy home will cling to the young adventurer when his turn comes to plunge into the wild waters of a turbulent world. In the case of him who is under the sway of virtuous principles, these sacred remembrances will never lose their power; whilst in the case of him who has swerved from the path of rectitude, the Sabbath counsels of a serious father, and the fervent pleadings of a pious mother, will vibrate upon his ear amid the guilty excesses of a profligate career. The earliest impressions of home are generally the deepest, and the last to be effaced; and where these are of a pleasing and salutary character, they will often act like an anchor, in steadying the heart of the young sinner, and preventing him from driving headlong on the rocks of destruction! But there is yet another aspect in which the domestic advantages of the Sabbath may be viewed.

III. THE SABBATH AFFORDS FACILITIES FOR THE PROMOTION AND EXERCISE OF FAMILY PIETY.

The ordinary work-days of most of our operatives are necessarily so engrossed by their out-door occupations, and the time consumed in going to and fro, that, whatever their inclinations may be, they seldom have opportunity to indulge in the offices of family devotion. Business, as now conducted, is so thoroughly worldly in its spirit and requirements, and so greedy of every moment it can wrest from its slaves, that no space is left between the rising and the setting sun, for the pious laborer to assemble his household around the domestic altar. His meal-times barely suffice to enable him to reach his home, to appease the appetites of nature, and to retrace his steps again. Thus the devout workman, however his soul may pant for a brief daily season which he may consecrate to the social exercises of religion, finds himself irresistibly borne onwards by the tide of human selfishness, and compelled to conform to many of the customs and restrictions imposed by the ungodly.

But here again, as elsewhere, the mercy of Heaven interposes on behalf of its vexed children. Every seventh day that breaks upon the groaning world publishes liberty to these lamenting captives. The rich banquet which this day spreads, atones, in some measure, for the spiritual scarcity of the week. On the Sabbath the perusal of the Scriptures may be resumed, the re-united household, free from the inquietudes and claims of secular duties, may meet for praise and prayer around the throne of grace; the well-matched pair will take sweet counsel together, and of the Lord; the in-inquisitive children, gladdened at their father's sojourn among them, will drink from his lips the words of sacred instruction; friends and kindred dropping in, will fraternize with the family in their communings with each other and with heaven, and go away bearing a rich blessing in their souls; songs of rejoicing and canticles of praise will resound through the templed cottage, whilst the foretastes of heavenly bliss will often ravish the hearts, and the foreshadowing of a coming glory will gleam upon the countenances, of its happy inmates. Nor will the public ordinances of divine worship interrupt this holy fellowship. An intelligent and earnest piety in the rulers of the family, will generally so contrive, as that most, if not all, of its members may repair in company to the house of God, and there celebrate divine mercy with the great congregation of Israel.

Such are some of the inestimable privileges which the Sabbath institution guaranties to the families of the working classes. It requires, therefore, but a glance to perceive the deranged and godless state to which the repeal of the Sabbath law would reduce them. The natural affections of the lower orders would thereby be blunted, and a diminished interest in each other's well-being would ensue in consequence of the infrequency and hastiness of their family intercourse. The several members of the same household would grow up in strange and freezing apathy towards each other. The children would seldom see the father, except for a few hurried minutes, and then it would be when he is chafing beneath the labor-yoke, and when his eye is continually roving to the admonitory hands of his watch—a time not at all calculated to encourage the reciprocities of paternal and filial love. The father, too, on his part, never having a few consecutive hours of leisure, to enable him to explore the mine of household treasure which he nominally possesses, would soon feel the chain of labor drag as heavily as his dead heart within him, while the brawny arm of energy, and the soul of enterprise, would flag, because the inspirations were wanting. For, where ambition, or covetousness, or emulation stimulates one to indefatigable effort, love impels thousands on in the fierce races of human industry. Think of this state of things everywhere existing among the working classes—think of homes divested of their attractions—think of the bonds of sympathy between the closest kindred universally relaxed—think of the strong affinities of nature which, for lack of adequate domestic fellowship, are dying out of human hearts—think of hard labor, thus deprived of its elastic spring, going on with sluggishness and languor, for who would toil and sweat, and "grind the bones out of his arms," without a powerful motive?—and what motive is sufficiently strong to urge millions of our yoke-fellows to menial offices all their lives, save necessity to provide for themselves, and love towards those dear ones who have a natural claim upon their services?—think of the consequences that would ensue from the withdrawal of this mainstay of the industrial habits of the people, and infer therefrom the inexpressible advantages accruing to innumerable family groups, and to society at large, from the maintenance of the Sabbath from all secular and carnal innovations.

The extinction of the Sabbath, moreover, as a day designed to be especially devoted to religious pursuits, must lead to the extinction of domestic piety; and wheresoever piety shall cease to have a voice and an altar in the house, it will simultaneously cease to have an embodiment in the church, and an existence in the world. Were religion, with its angel-retinue of graces, to be thus banished from our earth, godlessness and impiety, with their demon-throng of attendant evils—oppression, extortion, discord, hatred, revenge, blood-thirstiness, and every species of sensuality that can debase the human form—would reign and riot unchecked among mankind! Between us and a catastrophe so dire stands the Sabbath day, whose seemingly frail barriers were originally built, and whose dilapidations from age to age have been repaired, by the hands of a divine artificer.

The Rules to be Observed in Making Butter.

In making good butter there are several nice operations to be gone through with, which require an eye to cleanliness, forethought and experience.

1. On milking clean, fast yet gently, regularly twice a day, depends the success of the dairyman. Bad milkers should not be tolerated in a herd; better pay double the price for good ones.

2. Straining is quite simple, but it should be borne in mind that two pans about half full each will produce a greater amount of cream than the same milk if in but one pan; the reason of this is the greater surface.

3. Scalding is quite an important feature in the way or making butter, in cool weather; the cream rises much quicker, milk keeps sweet longer, the butter is of a better color, and churns in one half the time.

4. Skimming should always be done before the milk becomes loppered; otherwise much of the cream turns into whey and is lost.

5. Churning, whether by hand or otherwise, should occupy fifty minutes.

6. Washing in cold soft water is one of its preserving qualities, and should be continued until it shows no color of the milk by the use of the ladle; very hard water is highly charged with lime, and must in a measure impart to it alkaline properties.

7. Salting is necessarily done with the best kind of ground salt; the quantity varies according to the state it is taken from the churn; if soft, more—if hard less; always taking taste for the surest guide.

8. First working, after about 24 hours, is for the purpose of giving it greater compactness.

9. Second working takes place at the time of packing, and when the butter has dissolved the salt, that the brine may be worked out.

10. Packing is done with the hands or with a butter mall; and when butter is put into wooden vessels, they should be soaked two or three days in strong brine before using. After each packing, cover the butter with a wet cloth, and put a layer of salt upon it; in this way the salt can easily be removed at any time, by simply taking hold of the edges of the cloth.

Butter made in this way will keep any length of time required.—*J. C. Adams, G. Farm.*

The above, which we cut from the *American Eagle*, York, Pa., contains much that is is true and important. Whether the 6th item about washing, is correct we doubt. Indeed we believe the less water is used the better, that water injures rather than helps the keeping qualities of the butter.—*Editor Plough, Loom and Anvil.*

The Original Horse Tamer.

The N. Y. *Spirit of the Times* says Denton Offutt, who claims to have taught Rarey 26 of the 31 great principles included under the head of his art, has sailed for England, where he is to teach the art of taming vicious animals to the nobility. He claims that he can do all that Rarey can and something more. The *Spirit* says of him, "Offutt is an original in his way, and goes into the philosophy of things, not confining himself, like a currycomb, to the surface of the horse, but working his way under the skin, and into the muscles and bones, and developing what he is pleased to call "the magnetique and galvanick powers, as is connected with the navis sistem."

Dairy Salt.

A correspondent of the *New England Farmer* furnishes the following mode of preparing dairy salt: "Take the best crystal salt, wash it, dissolve, strain, settle and turn off; boil it down in some perfectly clean iron vessel, skim as boiling; when stirred off dry, it will produce fine salt, white as the drifting snow, which, if stirred up in a glass vessel of water, will produce no sediment, and will be distinct from any mineral or other possible impurity."

A fool in high station is like a man on top of a monument—every body appears small to him, and he appears small to every body.

Shrubbery.

We have of late been oftener addressed about laying out and improving gardens, than we could find time to reply to properly. At any rate, we were forced to cut our reply short when the writers' queries concerned more the philosophy and the abstract of the art than their application to a distinctly described plot of ground.

This brought to our mind the idea of now and then giving our views of the details of landscape-gardening in these columns.

And we single out shrubbery for this article, because it would appear to us that this class of ornamental plants is best known to the public at large. A city man wants to pitch his tent outside the gates, and these days of horses and steam-cars fairly threaten to bring the city into the country,—or a farmer actually comes to think he might do a little towards appearances and beauty in the surroundings of his house, what else presents themselves to their minds but flowers and trees?

Quite natural, too, for crude minds who are only impressed by the colors of the flower or the grandeur of the tree, and have no eye either for effect or for detail. Mention the word "shrub," and they look upon it as something inferior, as by-play, as not at all essential to their purpose. They want something to look "big."

We will, therefore, try to show the value of shrubbery. Let us suppose that we have to deal with several acres, which are to be laid out, or, if laid out, are to be improved by planting. Now, flower-beds judiciously planned, placed and executed, are well enough, but by far the greater part of the ground is to be park or park-like. You have large trees in abundance, we will say. You cut paths and drives through them, you open clearings, perspectives, and use a good deal of newly-awakened ingenuity, (reader bear in mind we speak not to the initiated,) still, with all your efforts, the grounds seem and are monotonous. It is a forest, at best a grove. Look close and you will find that either the trees are not diversified enough in kind, or the ground without much variation in surface, or running water missing. In all probability, however, you will find that the trees are too much of one age, and offer the eye no variety in outline and effect. Now, how remedy that?—Simply by offering more foreground to the spectator; in other words, cut down a good many trees, so that the rest may be seen to better advantage. And let the fringe of the woods remain jagged, so that the leafy line runs in and out, that the clouds my run their broken shadows playfully on it, that the sun may hide between the green promontories, that the fresh grass may, bay-like, run into the plantation. Bring into prominence old trees by cutting away the rabble round them; young trees, by isolating and clumping them, that they may show like a juvenile party, and not stand meaningless among their elders. And—we have arrived at the point now—bring out your shrubbery. It is that which is the link and the transition from open space and green grass to forest growth. It is shrubbery by which the comparatively blank space of turf and the tall occupants of the soil are best measured, by which they both get their value, by which they both are best set off, and by which their contrast is best and most pleasantly felt. All this is of tenfold force if you have to deal with level ground where Nature did not bring you variety as her gift. But even where the introduction of shrubbery is least necessary, it will still improve and heighten the romance of the grounds.

Suppose, now, we have to deal with a half-acre lot. Here shrubbery rules omnipotent, and the tall trees have to play second part; for what else, dear reader, do you want to create round your house but a small and fair epitome of Nature, a short abstract with the best points in it. To be sure for immediate effect, you will plant all manner of young trees, and in this you are right. But one single Pine or Elm will, when grown up, give you probably more shade, darkness and dampness, for that side of the house, than you wish; and it will not "live and let live" the smiling grass now round its base. Your place will *not* be that epitome and short abstract wished for, but will be only so many trees of lank trunks and rigid countenance, with a house standing gloomily amongst them. And now take to shrubs, planting a tree only where you want *actual shade*. Dispose of the shrubs as if you had a five-acre lot and as if *they* were *trees*. Avail yourself of the great differance in height and shape amongst them. Look how they will frame and dimple your *large* lawn, (for you must have a large lawn, be your place ever so small,) since you will remove or cut them down when they get too big. Look how they will consort so gracefully with your flower-beds, which trees will never do, not even young ones hardly. And look what a finished appearance, nay, what a semblance of vastness they will impart to your cherished little home.—*Gardener's Monthly.*

The Southern Planter.

RICHMOND, VIRGINIA.

Agriculture as a Profession.

The lot of every man in the entire human family, has been cast for him by the wisdom of Divine Providence, and although it may sometimes seem that to some particular member, the lines have fallen in pleasant places—yet the destiny of life and its attendant circumstances, may be summed up in the words of Job, "*Man is born unto trouble.*" No occupation, or profession, can exempt him from the disquietudes and penalties attaching to his birth-right. We are sensible of happiness only when we contrast our present feelings with those of a past period, which excited in us emotions far less agreeable. It is natural for us all—in ignorance of the vexations and cares which may visit our neighbors—to bewail our own hard lot, and think it *the most arduous* of all professions. We should often be speedily cured of this fallacy could we exchange places with some of those whose positions and employments excite envy. If it be true that "nothing is worth having which costs no trouble," then is life not only the more desirable, and to be enjoyed the more, for having within an element which can always furnish it with the spice of variety, and frequent strong contrasts, to relieve it of monotony. But while all persons of every class must expect to bear their share of the "ills of life," still there is to be had among the different avocations of men, at least "a choice of evils." While each profession exacts the onerous performance of different labors, there is, too, a difference in the *rewards* which they bestow upon their faithful followers.

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Our own great nation's father said that agriculture was the most "noble, healthy, and useful employment of man." Surely, 'tis wisdom "not to give up happiness for power," and that profession which is at once the most noble, useful, and healthy of all others—gives the most flattering promise of bestowing happiness, by furnishing the all important source of "a sound mind, in a sound body."

While agriculture is free from many of the corroding and heart-sickening cares which fall to the lot of the merchant, lawyer and physician, and does not demand harder physical labor than the mechanic must exert, she does demand, from the man who would succeed in it, as much patience, perseverance, good sense and sound judgment, as does *any* other. The farmer should have these qualities, as well as prudence and industry. He should not only be willing to think for himself, but he should strive to enable himself to think aright, by cultivating, to the best of his power, these qualities. His labor being no greater than that of other men, he has pleasures which are bestowed upon him by the nature of his duties, which cannot be found in any other pursuit. "Under his own vine, and fig tree," he enjoys more freedom and relaxation of body and mind, than the denizen of the city, who, shut out for a large portion of his existence from the view of nature's sweet face, and the balmy air of the fields, is dependent upon the public for support—often longing for a repose, and a "sniff of fresh air," which he cannot obtain within the confines of the city. The same good qualities of character, which win success in other pursuits, will secure for the farmer, if not wealth and luxury, competence, if he is content to force his wants within the limits of proper expenditure, and not neglect his business. But apart from all considerations of "money making," the occupations of agriculture bring pleasures which cannot be derived from any other source. If the farmer has done his work well, he will see the benefits arising from it, not only in the improvements of houses and lands, but in the ameliorated condition of every living thing confided to his stewardship; and he may feel, with excusable pride, that he has not been merely "a cumberer of the ground," but a liberal and generous son to the mother who fosters and supports him. But if he has not in any degree helped to subdue and replenish the earth, so that useful and remunerating crops may usurp the place of noxious weeds; if he feels no pleasure at witnessing a field "clothed in living green," by his own industry and good management, other than the hope of increased profit for his coffers; if his heart is not full within him, when he sees this eloquent rendering of nature's thanks for his generous care, and he fails to recognize in such a picture the blessing of Providence on his own industry, then is he the wrong man in the wrong place—his post might be better filled by another. Naught but vexation, labor and exposure will await him, while the chief rewards of the agriculturist never can be his. Let no man enter into the ranks of the agriculturists, lured hither by the sole aim of amassing dollars and cents. Such an one is only a fit recruit for a corps of "land skinners," whose occupation consists in marring the beauty of nature, and the handiworks of nature's God.

A proper discharge of the duties pertaining to the agriculturist, demand, therefore, his most unremitting attention to the following points:

1st. His obligations to his own farm and household—embracing the improvement of his land by proper tillage, manuring and draining, with a judicious rotation of crops—a regard for the physical and moral wants of his family, including his employees, and the extension of liberal and humane treatment to his domestic animals.

2nd. His duty to his neighbors—not only by living as far as it be possible for them—in amity, and social fellowship with them all; but in setting them an example worthy of imitation, both as regards the excellence of his tillage, and general good management of all committed to him, but in stimulating and helping them onward, to the best of his ability, in all improvements of their social, mental, and moral condition.

The man who lives with a sense of these obligations before his eyes, and in the habitual discharge of them, *not only deserves, but wins, the respect and warm esteem of his fellows.* He will enjoy the tranquil happiness and rewards of a peaceful conscience, which ever attends the consciousness of duty done.

Tobacco-Handler.

We witnessed a few days ago, the operation of a newly invented rolling machine for straightening tobacco before it is put into the hogshead It is the invention and patent of a gentleman from Albemarle County, Va., and will be for sale at the establishment of Messrs. George Watt & Co., of this city, where a model can now be seen.

The principle is the same as that of the "rolling mill" for making "iron rods." The tobacco (in bundles) is run through round grooves made in two cylinders, both of which are kept in motion by a windlass and one cog wheel, and is subjected to pressure (the degree of which is regulated by a spring) from head to tail. This operation is performed quite rapidly, the size of the machine allowing some five or six bundles to be put through at one time.

Hints to Horse-Keepers.

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How to Breed a Horse.	How to Physic a Horse. (Allopathy & Homœopathy)
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And chapters on Mules and Ponies. By the late Henry Wm. Herbert, with additions including "Rarey's Method of Horse-Taming," and "Baucher's System of Horsemanship"—Directions for the Selection and Care of Carriages, and Harness of every description, and a Memoir of the Author.

Price $1 25. Beautifully illustrated.

We have received from A. O. Moore, Agricultural Book Publisher, No. 140, Fulton street, New York, a copy of this work, which is, as it purports to be, "A *Complete* Manual for Horsemen." We do most cordially recommend it to horse owners, as the very best work we have ever seen on this subject at a moderate price It is cheap, useful, and entertaining.

The Quarterly Journal of Agriculture.

Published by the United States Agricultural Society and edited by Ben. Parley Poor, Washington, D. C., pp. 88, octavo.

This paper is conducted with industry, good judgment and ability. It is published at the Rooms of the Society and mailed to Life and Annual Members. It is printed on good type, but very inferior paper.

The Virginia University Magazine.

Published under the auspices of the Literary Societies of that Institution, and edited by James Edwin Cox, of Chesterfield; John A. Herndon, of Pittsylvania, and Wm. Wallace Bird, of Washington, D. C.

Its character, Literary and Antisectarian. Reading matter, 48 octavo pages. Price $2 per session of nine months.

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The Hampden Sydney Magazine.

Published by the Union and Philanthropic Societies of the College, and edited by R. D. Beach, B. Hughes, W. M. Tredway, jr., J. M. Smith, R. C. Osborne, R. W. Ramsey, J. M. Murkland, and I. P. Osborne.

Devoted entirely to Literature, and strictly neutral in Politics and Religion. Contains 40 pages of reading matter at $2 per session of ten months.

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We cordially welcome these periodicals as highly prized accessions to the list of our exchanges. They both challenge the most respectful consideration by their well sustained claims to literary excellence; maintaining in the character of their articles an expression of style, at once luminous, chaste, and classical, and characterized by purity of taste, beauty of diction, and fulness of illustration, without superfluity of ornament.

The conductors of these magazines have a mission of public beneficence to fulfil, worthy of their highest aspirations and efforts, which we are persuaded can only fail of its accomplishment through the want of a proper appreciation of their labors and sympathy with them in their work.

Let all who would cherish and sustain our own institutions, who would strengthen the growth of pure moral principles, and elevate the standard of the literary attainment, and intellectual development of our own sons—bone of our bone, and flesh of our flesh—count it not unworthy of their liberal patronage to sustain these periodicals, nor of their special, earnest efforts to extend their circulation as diffusively as possible.

The Construction and Use of Reaping Machines by the Romans.

[We are indebted to the research of that accomplished scholar and historian, PROFESSOR HOLMES, of the University of Virginia, for the following most interesting description of a Reaping Machine of such antiquity as to have been in use among the Romans, probably from near the commencement of the Christian era.

It was furnished more than a year ago in response to the request of Mr. Noland, of Albemarle, preferred to the Professor through a friend, and was by him transmitted to the late Editor of this paper for publication. It was accidentally mislaid, so that its recovery was not in time for its seasonable appearance last year. Through the kindness of Mr. Ruffin we are enabled to present it to our readers at this time, when the subject of Reapers is most likely to attract their notice.—EDITOR S. PLANTER.]

Charlottesville, April 15th, 1858.

DEAR SIR—In acccordance with your request, I send you for communication to Mr. Noland, the interesting extract from Palladius, which proves that the Romans were acquainted with the Reaping Machines, and gives a satisfactory description of its construction and use.

The date at which Palladius lived and wrote is uncertain, but the most probable period assigned for the composition of the work on Agriculture, is the middle of the Fourth Century of the Christian era. As Palladius, however, was mainly a compiler, and borrowed largely from Varro, Columella, Gargilius Martialis, the agricultural authors employed and mentioned by the elder Pliny, and the Greek writers who furnished the materials subsequently incorporated into the Geoponica, the era of Palladius by no means determines the date of the inventions or processes specified by him. Thus, we might safely infer from the character of his work, without other evidence, that the Reaping Machine was not first introduced in his day, but had been transmitted to it from a previous age. But we are not left to conjecture. In the middle of the First Century after Christ, the same machine is briefly noticed in the Natural History of Pliny—and there may be reason to suspect that a similar implement is referred to by Varo, a century earlier, though Varo's statement is so hurried and obscure as not to afford a safe foundation for any decided conclusion.

Before quoting and translating Palladius, I ought to mention that I have had so few opportunities of examining our various modern Reapers, and have, moreover, so little aptitude for understanding descriptions of machinery, even when written in English or specified in patents, that I may readily have misapprehended the import of some of the phrases employed by the ancient author. Any error of this sort will be rendered still more excusable when the corrupt Latinity of that day, and the uncastigated text of Palladius are taken into consideration. Still the description seems to me sufficiently intelligible to enable any good mechanic to manufacture a specimen according to the specifications given.

The following is the language of Palladius:

Pars Galliarum planior hoc compendio utitur ad metendum, et pæter hominum labores, unius bovis opera spatium totius messis absumit.

Fit itaque vehiculum, quod duabus rotis brevibus fertur. Hujus quadrata superficies tabulis munitur, quæ fornisecus reclines in summo reddant spatia largiora. Ab ejus fronti carpenti brevior est altitudo tabularum. Ibi denticuli plurimi ac rari ad spicarum mensuram constituuntur in ordinem, ad superiorem partem recurvi. A tergo vero ejusdem vehiculi duo brevissimi temones figurantur, velut amites vasternarum. Ibi vos capite in vehiculum verso jugo aptatur, et vinculis, mansuetus sane, qui non modum compulsoris excedat. Hic ubi vehiculum per messes cœpit impellere, omnis spica in carpentum denticulis comprehensa cumulatur, abruptis ac relictis paleis; altitudinem vel humilitatem plerumque bubulco moderante, qui sequitur. Et ita per paucos itus ac reditus brevi horarum spatio tota messis impletur.

Hoc campestribus locis vel æqualibus utile est, et in us quibus necessaria palca non habetur.

Palladius, De Ke Russica—Junius.

In the level districts of the Gauls the following device is employed, and for the labour of men is substituted the service of one ox, which takes off the breadth of the whole harvest.

A carriage is made, and placed on two small wheels. The body of the machine is square, and protected with planks, which, leaning outwards, render the upper part wider than the lower. The planks in front are lowest. Here numerous pine teeth are arranged regularly, being proportioned to the growth of the grain, and bent backwards on the upper side. To the back of the vehicle two very short shafts are attached, like the poles of a litter. Then the ox is harnessed with the yoke and chains, his head being turned to the body of the machine. He must be gentle enough to be easily managed by his driver. When the machine is pushed through the grain every ear is seized by the teeth and collected in the wagon, the straw being broken off and left. The ox-driver, who follows, regulates from time to time the height at which the straw is cut. Thus, by a few traverses and returns, in the space of a few hours the whole reaping is accomplished.

This plan is expedient in level or smooth countries, and when it is not deemed necessary to save the straw.

To this description I add the passage in Pliny which shows that this Reaping Machine was known and used in the same regions three centuries before Palladius.

Galliarum latifundus valli prægrandes dentibus in margine infestis duabus rotis per segetem impelluntur, jumento in contrarium juncto. Ita direptæ in vallum cadunt spicæ.—*Plinius*, Nat. Hist., xviii. 72.

On the large estates of the Gauls huge boxes with teeth projecting from the front, and carried on two wheels, are pushed through the crop, the ox being attached behind. The ears, thus torn off, fall into the box.

The passage of Varro referred to, need not be quoted, but may be found.—*De Ke Rus.*, Lib. I., Cap. L.

I refrain from any comments on the description of this machine, as many considerations will readily suggest themselves from the inspection of the quotations—but will only observe that in several respects the ancient mode of construction seems to possess considerable advantages over its more complicated modern successors, especially in the manner in which the power is applied.

These indications will, I hope, prove sufficient to satisfy the reasonable curiosity of Mr. Noland.

I remain, very respectfully,
Your obd't serv't,
GEO. FREDERICK HOLMES.

Dr. Nelson, *Charlottesville*, Albemarle Co., Va.

For the Southern Planter.

Tobacco---Not the Bane of Virginia Husbandry.

Having undertaken to reply to Gen. Cocke's articles, entitled "Tobacco, the Bane of Virginia Husbandry," it now devolves upon me to notice briefly the points presented in his contribution, No. 3, to your May number. I omit any farther argument against his position, that it is the most laborious of all crops, having previously admitted the labor involved, and justified it on the ground that this labor was at no time excessive, and that it was amply repaid by the value of the crop. . . . . Before proceeding to the discussion of graver issues, I must notice the emphatic charge of Gen. Cocke, that the planter, in consequence of tobacco absorbing all the manure, has frequently to submit to the heavy affliction of having "no greens to boil with his bacon," but fortunately, he says, "Divine Providence has kindly provided *poke, dandelion and peppergrass,*" on which *Nebudchadnezzar diet* the poor planter is compelled to graze for many weeks in the spring. Not being of *Dutch* extraction, I can only say in answer to this overwhelming argument, against tobacco, that a certain income is, to men in the condition of *this deponent*, of far more consequence than "greens," but if they cannot be dispensed with, there is no place in the world like a *tobacco plant bed* to insure a supply of cabbage plants, consequently, this is among the advantages of tobacco—it insures a supply of cabbages. The stinted household comforts, with which he charges this crop, are the result of bad management, and not tobacco. The premium lists of the Virginia Agricultural Society, will show a large proportion of premiums, for fine stock, awarded to planters, while I distinctly recall one instance, in which the Richmond Examiner (upon grounds which I did not think sufficient) alluded to the stock exhibited by a distinguished wheat grower, as apparently having been fed on "total abstinence principles." . . . . Gen'l Cocke charges that tobacco and grass are "irreconvertable antagonists." . . . . I claim that it is folly to sow grass seed on any land not left by the preceeding crop in fine tilth and good heart, and that tobacco, fulfilling these conditions, is the best preparation for grass, and insures a stand. . . . . It is usual for the planter, if he is a good manager, to make clover enough for his own consumption, and if he does not compete with the north, it is frequently because, remote from public routes, he is driven from the market by the cost of transportation. That hay and tobacco are not "irreconvertable antagonists," I refer to the fact, that Z. R. Lewis, and Henry Guant, on James River, secured, last summer, more hay than I have ever seen on the Bremo, or any other wheat estate on James River, and that the James River and Kanawha Company, last year, purchased their supplies of hay from a planter, who, in point of management, is among the least of that large body of intelligent agriculturists, whose vindication, for want of a better champion, I have attempted.

If northern hay is to be driven from our markets, why does not Tide-Water Virginia do it. She has no staple that interferes, and thousands of acres adapted to the purpose, and convenient to navigation, invite her to this profitable enterprize. As to the impoverishment of lower Virginia, claimed by Gen'l Cocke, to be the result of the cultivation of tobacco, many years since, it may be said, that much of that district was *born poor,* and that much has been exhausted by the improper cultivation of corn, to which latter crop is directly traceable nearly all the "gullies" that disfigure our State. . . . . Had its early settlers evinced the same zeal in the improvement of their soils, and the application of Ruffin's discovery, that they manifested in the pursuit of the fox and the enjoyments of social intercourse, that portion of the country would not be as sterile as Gen'l Cocke represents it to be, under a grain system, which has prevailed exclusively for many years past. . . . . Having previously considered the charge, that it is the "most exhausting of all crops," I will now only refer to the opinion of a distinguished French* writer, who declares "that tobacco, instead of exhausting the land, *improves* it like the artificial grasses;" and to the following direct testimony of Arthur Young, an authority which Gen'l Cocke will not dispute. Mr. Jefferson urged the substitution of wheat for tobacco, which is Gen'l Cocke's position. Arthur Young says, (see his agricultural tour through France,) "that as the exhausting character

*De l'Administration Provinciale, parell. le Trone, Tom. 1, p. 267.

of *wheat*, which is sufficient to reduce a soil almost to a *caput mortuum*, it is too well known, and too well described to allow any question at this late day, and how wheat is made to raise animals, we must go to America to learn, for just the contrary is found here. Tobacco (he continues) cannot demand an uncommon degree of heat, because it has been cultivated on 1000 acres in Scotland; and *as to its demanding too great exertion*, the free labor of Europe *voluntarily* addicts itself to its cultivation, which has in it nothing so laborious as cutting wheat. I take it, (says Arthur Young,) that the American case is this, *ill husbandry, not tobacco, exhausted the soil*." There it is, in a nut shell, and the whole argument, which is too lengthy for an insertion here, is a complete vindication of tobacco from the charge, that it is necessarily exhausting. But Gen'l Cocke has, himself, made an admission fatal to his argument on this point, for in a note to his May number, he says, "it is admitted that tobacco-makers, by the improvements of modern culture and the introduction of guano, may *positively* improve their estates." These authorities settle this point, and it needs no farther discussion. . . . . Gen'l Cocke says his views "have been presented to the agricultural community as seeming to rest on the well known principles of rural economy." They are defensible on no such ground. Misery and ruin would be entailed on thousands, if he could succeed in suppressing this interest, the value of which is computed by millions. If he makes a personal appeal to any planter, to abandon tobacco, it devolves upon him to show what will supply his loss of income, but he has not yet done so. Every cultivator should consult the nature and disposition of his land, and at the same time properly estimate the nature and capacity of his labor, and proceed to the cultivation of the most profitable staple that presents itself, even if it is only to *make black-eyed peas*. Upon this principle the planter adheres to tobacco, for he has the experience of a century to prove that it is the natural and proper staple for his soil. . . . . Gen'l Cocke recommends, in lieu of the tobacco preparation for wheat, a difficult, expensive, and laborious system of fallow, which would be appropriate to not ten acres in a hundred, in the generally broken district of the country in which tobacco is grown. . . . . Suppose Gen'l Cocke was divested, for a series of years, of his magnificent river estate, and was condemned by inexorable necessity to the cultivation of one of a thousand broken and partially cleared farms, which is the description of many a planter's home. Let him be forced to cultivate this farm, overrun by sassafras and briars, without a capital and possibly in debt, with limited labor and with the claims of a large family, all of them to be supported and educated, I respectfully ask him, "what will he do with it," and it is a question upon which far graver issues hang, than have ever been evolved by Bulwer from the disposition of the lordly Darrell's domain. . . . . Thus situated, (and thousands of those whom he is now persuading to abandon the cultivation of tobacco have these difficulties,) how would he go about improving his land, and making a living at the same time? Would he introduce the drill and reaper on lands too steep to cultivate with a double team? Will he recommend guano, bone-dust, and lime, to a man unable to buy and glad to resort even to "poke dandelion and pepper grass," rather than lose valuable labor in making doubtful experiments? Will elaborate wheat fallows, prepared with $100 clod-crushers, be the system, where the land is so broken that the planter uses a ground-slide instead of a wagon, to keep from turning over? Must such a man spend his energies in the cultivation of crops not adapted to his farm, merely that he may have a better opportunity to lay in a supply of "greens and turnips?" No, let him discard all implements not suited to his land, let him stick to the grubbing-hoe and the coalter, and his "pepper grass" diet, if he can do no better, and in a few years he will be able to buy a better farm, when he can adopt some of the improvements, which are well enough in their place. How does the wheat substitute answer elsewhere? It is well known that no portion of our State is more indebted than the Valley of Virginia, in portions of which so disastrous have been the failure in crops, for several years past, that a call was made through the public press, invoking the assemblage of the Legislature, that a *stay* law might be passed and relieve its burdened population until better times. . . . . I am authorized by Mr. Mayo Cabell to state, that Mr. Thomas Nelson, who recently bought Benvenue, assigned as his reason for removing from Clarke, (the banner county of Virginia,) that so uncertain and precarious was wheat culture, even on the fine lands of that county, that himself and sons had been constrained to remove to Eastern Virginia, and adopt the mixed system of farming. His fine estate in Clarke, valued at $45 per acre, only yielded 500 bushels of wheat, while here it is not uncommon for the planter to make from one to two hundred dollars to the hand from tobacco, and fine crops of corn, wheat and oats, besides. . . . . I now come to Gen'l Cocke's final argument, the example and experience of Mr. Richard Sampson. . . . . He says it is, probably, the strongest argument he has presented, and I answer it is no argument at all. . . . . When Gen'l Cocke has provided every planter with as good an estate as Richard Sampson's, (and he will have to go to the Mississippi to do it,) it will be time enough to put them on Mr. Sampson's system. . . . . It is claimed that Mr. Sampson is the most successful agriculturist in Virginia. I am informed that he laid the foundation of his fortune by making tobacco, and both himself and Gen'l Cocke have been judicious enough to expend the immense incomes derived from this source in the permanent improvement of their estates. . . . . But I have no hesitation in saying, that planters can be found in every county, who, taking capital, &c., into consideration, are doing as much for the improvement of their lands, and have been as successful as any wheat grower Gen'l Cocke can produce, himself included. Mr. Sampson says, "when he made tobacco, it took half the labour, and yielded but one fourth of the value of the other products." This is a most unfortunate remark for Gen'l Cocke, for what now becomes of his argument, that tobacco starves everything else. The whole drift of his argument has been to prove that if tobacco is cultivated, it must be done at the expense of other crops; and Mr. Sampson testifies, not that it prevented him from cutting other crops, but that at the time he abandoned it, it did not pay, which is very probable, inasmuch as tobacco, like all other staples, occasionally falls below the cost of cultivation. . . . . In conclusion, Mr. Editor, I must say that while Gen'l Cocke recommends a system very well adapted to wealthy farmers on valuable estates, I have sought in this discussion to promote the good of the greatest number, knowing that men of wealth can live under any system. I have appeared, reluctantly, as a contributor to your journal, for I claim no privilege, on the score of perfect practice, to instruct my agricultural brethren. What little local reputation I once had in farming, I lost when I abandoned tobacco and tried to make wheat my staple crop; and I am aware that I have been guilty of rashness in entering the lists with my respected opponent.

My parting advice is, don't quit tobacco until you get an "Alabama adjunct," for you will never get it by farming if you do.

J. B. McClelland.

May 13th, 1859.

Breadstuffs—War—Money.

The probable influence of the war upon American interests is a subject of continued anxiety in the commercial circles, and thus far the signs are of adverse effects. It is very early to judge of the crops, which both here and abroad, have but spread verdure upon fields, and have yet to encounter many vicissitudes before they can develope their extent and quality. On them depend, however, almost entirely the amount of benefit, or rather the extent of injury, which United States commerce is to suffer by the war that may involve all Europe in its vortex. The excitement that the food markets have thus far experienced is factitious. There are as yet no indications that for the present year, at all events, more food will be wanted in Europe than their own large crops will supply. The largest customer for foreign corn in peace or in war is, doubtless, England, and the price there depends upon the quantities which France and Europe generally can spare. This year those countries have a large surplus, and war operations for the present will only diminish that surplus, but there may be after all as much as will meet the wants of England. The prices everywhere are unusually low, but some speculative movement has raised prices in Great Britain 37c. per bush. at a season when prices usually rise, and from prices that have not been lower in ten years, and which are now far below the prices in New York. Under all these circumstances, there is little chance of any very large exports of breadstuffs and provisions from the United States for some months.

In order the better to estimate the exact effect of war upon prices and quantities of food, we turn to Parliamentary tables, and take the actual prices at various points of Europe during the first 13 years of the present century, when every part of Europe was visited in turn by victorious troops. It will be observed that the effects were not what are supposed generally upon the value of food, as follows:

IMPORT OF GRAIN INTO GREAT BRITAIN.

	From United States.	Total from all ports.	Great Britain	France.	Boulogne.	Berlin.	—Dantzic.—	Export.	Corunna.	Ancona.
	Qrs.	Qrs.	s. d.	s. d.	s.	s. d.	s. d.	Qrs.	s.	s. d.
1800....................	77,609	1,264.520	66 11	50 5¼	37	39 1	73 9	439.271	22	40 11
1801....................	245.371	1,427,765	110 5	56 4	45	42 4	78 11	404,232	30	63 8
1802....................	79,413	647.663	115 11	62 4	16	47 2	53 5	563,472	23	85 2
1803....................	109,131	373,725	67 9	63 2	16	56 10	46 3	367.102	16	72 6
1804....................	4,258	461.139	57 1	49 2	35	56 6	53 3	449,210	26	54 5
1805....................	13.453	920.833	60 5	49 0	22	60 1	69 10	482,890	20	34 1
1806....................	79,763	310,342	87 1	49 6	17	77 6	58 6	63.145	15	40 3
1807....................	249,712	404.946	76 9	48 10	17	49 8	.. ..	..	18	38 9
1808....................	12.836	84.888	73 1	42 5	17	45 6	.. ..	..	17	30 2
1809....................	170,939	455,987	94 5	38 0	16	27 9	44 0	..	16	29 0
1810....................	98.175	1.567,126	103 3	49 7	19	26 0	53 4	205.701	28	39 0
1811....................	18.011	336,130	92 5	67 1	23	38 8	36 3	46,053	28	54 0
1812....................	10,797	290,709	122 8	87 11	34	38 0	.. ..	..	28	54 0
1813....................	810	559.000	106 6	57 10	31	36 8	.. ..	..	23	38 0

It will be observed in this table that the prices in England were by far the highest, and that England was the only importer, except Spain, while she was the only nation exempt from war operations. She obtained a considerable portion of her supplies from the United States, until the embargo of 1810. In France, the price was the highest in 1804, when the Empire was inaugurated. At Berlin, the price was the highest in 1806, when the French were in possession. At Dantizir, the rates were low, and she did not cease to export, except in those years when the French sustained a siege in the city. In 1800, the year of Marengo, corn was lower at Ancona than in several succeeding years. It was highest in 1802 in time of peace, owing probably to the exports. At Corunna, in Spain, the prices are given in reals, or 5. per Ferrado of ½ bush., hence in 1801 wheat was about $3 per bush., but in 1808, when the French entered Spain, the price was only $1.70 per bush., and in 1809, when the English held Corunna and Sir John Moore's army was driven out, the price was only 16 reals, or $1.60 per bush. From that date, however, to the close of the war, it continued high. The quotations at Boulogne are in francs per hectolitre, of which three equal an English quarter of 8 bush. In the two years ending Sept., 1805, 200,000 French soldiers occupied the camp at Boulogne for the invasion of England. In Sept. of that year the camp was broken up and concentrated round Ulm to meet 500,000 Austrians, Russians, English, Neapolitans and Swedes. During the two years that Boulogne was occupied, the average of grain was 22½ francs per hetolitre, or 54s. per quarter. When the troops left the price fell to the former rate—about 36s. per quarter, but it will be observed that while the camp was at Boulogne the general average for France was less than before. It is to be further borne in mind that the means of communication in those days were less than now—land carriage was very difficult and by water impossible, except to England. At the present time all the Russian and Egyptian grain countries are open to French and English markets by steam. Spain, which was then an importer of grain, has now become an exporter of late years, and is not likely to be immediately disturbed by the war. The above war demand was mostly for England, not because of war but because of bad harvests. The other countries of Europe have greatly improved in numbers of people, agriculture and means of communication. It is probable that a war out of the limits of France will benefit her agriculture more than that of the United States. In the meantime, the price of cotton declines rapidly under the war news, thus diminishing the character and aggregate of cotton bills. The disposition is also abroad to keep as much money in hand as possible, to take advantage of contingencies that may arise, and also to provide against unforeseen events. There are no investments in American stocks, but, on the other hand, quantities come out to be sold and the gold remitted home. The usual remittances of interest and dividends find no offset in funds for investment. The imports of goods are large, and the expenditure for travellers abroad is unusually large. Under these circumstances the export of gold for the first two weeks in May has been $4,500-000, and for the month the amount will not be much under $10,000,000. For the moment a new demand for gold is developed in the chance of a much larger number of immigrants to arrive. These persons come down to Havre, Antwerp, Bremen, and Hamburg, from all parts of Germany, with funds each of their own districts. Formerly, they brought that specie with them and sold it in the interior on their arrival in New York. It is now the case, however, that they are supplied with American coins at the place of their departure, hence among the late exports of gold have been considerable quantities of $10 pieces, or Eagles. Bars and $20 pieces are not very available for the emigrants, but the $10 pieces are very convenient. It is of course the case that all such pieces so sent abroad return in the pockets of the immigrants, and are expended here to some extent, but they are also carried into the interior and hoarded for a time. This now forms one element of the present export of gold, and it is not at all improbable that the number of arrivals will be very large—flying from the present horrors of war, with prospective ones of famine, which usually follows war. A great deal of gold will doubtless be wanted for army uses. The late elder Rothschild, in his evidence before the Bank Committee, stated that the last war of Russia upon Poland in 1830 produced an active demand for gold for the military chests. It is less heavy than silver, and therefore more available for that purpose, and "price is no object for such purposes—if 5 per cent. won't command it, 10 per cent. will." That was but a little war. France, Italy, Austria, Germany, and Russia, now all join in a demand for that purpose, and while every prudent banker and merchant increases his reserve of specie to the extent of his ability, all inhabitants of the probable theatres of war hoard money for the same reason. All these circumstances tend to produce scarcity of money, to send goods and securities to this country in or to realize the metals. The price of cotton has fallen, under the war news, but it does not appear to be a well-founded reason, judging from the past. Since the wars of the early part of the century the import of neither cotton nor wool into Great Britain was in any degree checked; on the other hand, the import of cotton which had been 9 million lb. in 1800, rose year by year to 93 million lb. in 1610, and the import of wool in the same period rose from 5 to 11 million lb. Notwithstanding the Continental system, those goods forced their way to the Continent, and redressed the exchanges against the large subsidies sent to the different Allies of England.

If we are guided by these facts of history, in addition to the more recent experience of the Crimean war, we shall come to the conclusion that the benefits to be derived by war have been exaggerated. There is little room to look for any increased business for ships or exporters, as a consequence of the calamities of Europe, but on the other hand, partly by reason of our loss of credit, we shall feel the influence of the demand for money which actuates governments, bankers and merchants at such a crisis.

United States Economist.

For the Southern Planter.

Frog Showers.

WASHINGTON CITY, May 18, 1859.

Sir,—In the Southern Planter for the month, you have an article on the "Cause of Frog Showers," extracted from Buckland's Curiosities of Natural History. The author treats the idea of the frogs coming down from the clouds, with ridicule and suggests that having been "hatched and quitted the tadpole state and their pond at the same time, days before they become visible to, or rather observed by, mortal eye, &c., they wisely retreated to the coolest and dampest places they could find, viz: under clods and stones, where, on account of their dusky color they escape notice. Down comes the rain, and out comes the frogs, pleased with the change," &c.

It is the fault of scientific men in dressing up suppositions, to give such rein to their imagination, that the simplest facts of nature are very frequently left out of view, from a wish to avoid what at the first sight appears to be a difficulty or superstition—and thus a still greater extravagance is *imagined* than the error to be combatted.

In the matter before us, we have an instance in point; and although I shall not pretend to show how the frogs get to the particular spot after a shower, I think I can show that Dr. B.'s theory is fallacious.

Some years ago, I happened to be in Edinburgh, (Scotland,) and while walking, one summers' evening, along the London road, having come to a gentle turn beyond the high school, found myself at the summit of a hill, the road descending in a straight line to the Piershill Barracks for about half a mile. At this point I observed a shower pass across the road, a short distance in front of me, wetting it for one or two hundred feet in width pretty thoroughly. On reaching the spot, I was surprised to find it covered with young frogs about the size of a finger-nail, and as I am curious in regard to natural phenomena, I commenced an examination into the matter as far as I could, with a view to satisfy my own mind as to whether the frogs could have been hatched on or near the spot, or had descended with the shower. I was rather loth to believe the latter, and like Dr. B. would willingly start from *terra firma* for a foundation to build a fact upon.

But, on the right hand side of the road was a high garden wall, and at some distance down was an iron gate leading into the grounds of a private residence; on the left a rough stone wall about four feet high, and beyond a plowed field. There was not a stone or pebble about the road, under which tadpoles could hide.* There was not a pond to be found on the hill—and the garden to the right, and the field to the left in the track of the shower, were covered by young frogs. Could these tadpoles, when just hatched, have travelled over field and road and garden? Could they have passed over walls four feet and six feet high? Could they have gone round by the gate to spread themselves exactly in the track of the shower, or a hundred yards down the road to the left to reach by another field or two the one in question?

The frogs seemed stunned or stupid, and it was hardly possible to walk without treading on them. If they had that moment come to life, or a higher existence, would they not have been very active?

Now, sir, we have some very remarkable facts on record, and admitted by naturalists, in regard to the transportation through the air of heavy bodies—why then a difficulty here? I cannot explain the phenomena of which I was an eye witness without coming to the conclusion that the shower had more to do with their dispersion in its track than Dr. B. would have us believe. For, there were no cool places in the road for them to hide away in tadpole state for any length of time or any time at all—there was no pond near, nor that had been dried up—there were two walls over which tadpoles could not climb—and therefore, unless we go to the extravagant conclusion that the *whole* country had been covered previously by tadpoles, which had wandered from some distant pond, we must give she shower credit for more than wetting the frogs into existence. C.

* Mr. Buckland is misapprehended by C., if he supposes that author meant to alledge that *tadpoles* could hide themselves under stones, &c. He says "the animals," (young frogs) "have been hatched and *quitted their tadpole state* and their pond at the same time," &c.

Editor S. Planter.

Fruit Trees.

Summer pruning, or pinching the points of young shoots, seems not to be so thoroughly understood as its importance demands. It is not too much to assert that the highest degree of cultivation cannot be reached, until its importance and necessity is fully comprehended and recognized. The whole aim of pruning is to modify and direct growth so as to render it subservient to the wishes of the cultivator. At no time can this be more readily attained than during the season of growth. It is much easier to prevent a shoot from growing now where it is not wanted, than to cut it off after growth is completed, just as it is easier to rub off a bud than cut off a branch. We allude to established trees. It would be well for all cultivators to study this matter practically. Especially is it desirable that a practice should not be condemned, in the absence of knowledge as to the proper applications of the principles upon which it is founded.

From Patent Office Report, 1857.

Adaptation of the Mountain Regions of the South to Sheep Husbandry.

BY GEORGE C. PATTERSON, OF ROGERSVILLE, HAWKINS COUNTY, TENN.

The opinion, which has heretofore generally prevailed, that the northern portions of the United States are better adapted to the purposes of sheep-farming than the southern, is gradually being removed by successful experiments, showing not only that this impression is founded in error, but establishing, conclusively, the converse of the proposition; that is, that, in all the essentials for profitable sheep-farming, a large portion of the Southern States possesses advantages incomparably superior to those presented by territory further north.

Beginning at or near a point on the 39th degree of north latitude, 150 miles from the Atlantic coast, and proceeding in a southwestward direction, as far down as the 34th degree, we find an expanse of country embracing about 180,000 square miles, the geological and climatological characteristics of which give to it advantages for sheep husbandry unequalled in any other portion of the United States, of the same extent.

This area of, say, 600 miles in length by 300 in width, includes large portions of Virginia and Tennessee, with considerable parts of Kentucky, North Carolina, Georgia, and Alabama, and a small portion of South Carolina and Mississippi.

The natural configuration of this vast region is not the least of the many desirable advantages it presents. It is situated many hundred feet above tide-water, fanned by the purest atmosphere, and supplied with innumerable salubrious streams. Having a high and dry range, so conducive to the healthfulness of sheep, and presenting a succession of mountain and valley, it affords the most ample defence against the heat of summer, as well as the bleak winds of winter. Artificial protection, indispensable at the North, yet so apt to induce disease, is thus rendered unnecessary in this more favored situation.

These valleys, or mountain gorges, are most prolific in a variety of herbage suitable for sheep, and, during winter, they afford a supply of pasturage so abundant that very little additional food is required. Especially is this the case when a portion of the range is reserved for the winter season, which is the proper course. Hence, the sheep have access to a continuous supply of green food, by which the secretory organs are retained in full action, and an uninterrupted growth of wool is promoted; while cases of constipation, frequently fatal at the North, by reason of sudden changes from green to dry food, are unknown here, there being scarcely a day in the year in which sheep cannot find sufficient green food to keep their digestive organs in healthy condition.

Many of the more elevated portions of this region are so naturally disposed to grass that it is only necessary to clear out the undergrowth—which can be done at an expense of about $2 per acre—when the indigenous grasses, such as Timothy, blue-grass, white clover, &c., will immediately spring up and take possession of the land. There are few ranges of any extent that do not furnish ample quantities of arable land for all the purposes of the sheep-farmer; and they frequently include a fair proportion of excellent meadow land. The soil in this region is generally good, and it is by no means uncommon to find it fertile even to the tops of the mountains; and although there are to be found considerable bodies of thin soil, yet even these are more disposed to the production of grass than lands of a better quality further south.

This thin soil is generally of loose texture, and, therefore, liable to be washed off by rains, unless appropriated to grass. The common sedge is the kind usually found upon it. When this is burned off, in early spring, a luxuriant range is afforded for sheep during the summer. It is not advisable precipitately to substitute the cultivated grasses on this land, since it is not capable of growing them successfully. By burning off the dry and decaying growth of the previous year, when its accumulation interferes with a succeeding growth, and close depasturing for a few years, the sedge will gradually give way to the more valuable grasses. It is well known to all sheep-farmers that, when lands are freely pastured by sheep, their capacity for producing grass is much assisted, as by close grazing the more useless grasses, briars, &c., are subdued, and the desirable descriptions allowed to strengthen their hold, and this, together with the tramping of the land and the droppings of the sheep, induces a more dense sward.

The "Randall Grass," said to have been discovered in one of the western counties of Virginia, promises to be the most valuable for sheep-grazing in the regions spoken of. From the many experiments resulting from the distribution of the seeds of this grass through much of Virginia and Tennessee, it seems to have met with universal favor. In character and growth, it closely resembles orchard-grass, but is more tenacious of life, flourishing under the most unfavorable treatment, and resisting the intrusion of sedge and other inferior grasses. It has a more profuse foliage than the orchard-grass, and a more slender and soft stem; it will retain its green color during the severest weather of winter, and exhibit an earlier growth in the spring than other grasses known in this region.

A comparative statement of the expense of maintaining sheep at the North and in this Southern country will exhibit the decided superiority of the latter, and materially assist us in forming correct conclusions. If we examine the various communications on this subject, contained in the Agricultural Reports of the Patent Office, we shall find the average expense of wintering sheep at the North to be about $1 25 per head, while in the region herein treated of it does not exceed 25 cents, or one-fifth the above amount; and in most winters, when the snow does not lie more than a day or two at a time, the cost of wintering is hardly worth computing. This difference in the expense of maintaining a flock is considerably widened when we contrast the value of lands in the respective districts. Those at the North, we may safely place at an average price of $20 per acre, while in the Southern region any quantity of lands suitable for sheep-walks can be purchased at an average of $1, and many large tracts at half that price, or even less; thus affording decided advantages to persons of small capital.

That the climate of the Northern States is more favorable to the growth of fine wool than the region to which I refer, repeated experiments are disproving. Although it is an admitted law of Nature that the covering of an animal will adapt itself in a great degree to the climate in which it abides, yet this does not prove that fine wool cannot be grown in a warm climate any more than that fine furs or fine feathers cannot be found there; for many animals, bearing the finest quality of furs, inhabit the most southern borders of our country, such as the beaver, otter, muskrat, and flying squirrel, and may be classed among the finest fur-producing animals; they are all found in Texas, as well as in the Canadas. The Merino sheep has been bred for ages as far south as the 36th degree of north latitude, in Asia; and we are informed by eminent writers on the subject that there is no perceptible difference in the fineness of their fleece from that of the flocks of Europe; and we have the testimony of the head of the great Lowell Manufacturing Company, who has purchased extensively from all parts of the United States, that "wherever there are good shepherds there is sure to be found good wool." The veritable samples of wool grown by an eminent sheep-farmer of Tennessee, (Mr. Cockrill,) are said to have exceeded in fineness those selected by an agent of our government from the best flocks of Europe; and this gentleman attributes its superior quality to the climate of that region, although it was grown nearly two degrees south of the scope of country of which I am treating, and not in the true grass region. Whether Mr. Cockrill is correct or not in his opinion, the fact is incontrovertible that the climate has worked no deterioration in the quality of the wool in the many years he has given wool-growing his attention. But whatever difference of opinion may exist on this subject, it is established beyond doubt that wool grown in a warm climate has a longer and softer fibre than that produced in the colder countries, although there may be no difference in the fineness of either; and the manufacturer will give a decided preference to the longer and softer staple.

Since the introduction of the Saxon sheep at the North, it is found that they are not capable of resisting the severity of that climate, and the breeding of them is abandoned as unprofitable; but it is reasonable to conclude that this most valuable variety of fine-woolled sheep, before long, will find its fixed place of habitation in the more congenial climate of the South.

There are but few wolves in this region, and as they commit their depredations only at night, all danger from them may be obviated by penning the flocks at such time, when they will also be secure from the attacks of curs, which are unfortunately but too plentiful in this wild and uncultivated region.

For the Southern Planter.

On the Culture of Tobacco.

OAKLAND, *Stafford Co., Virginia,*
May 30th, 1859.

Mr. Editor,—I have read with interest the articles written for your valuable "Planter," by the parties pro and con, on the cultivation of Tobacco. I am a young farmer and of course respect the opinions of farmers of experience, yet when there are two opinions as to the cultivation of any crop, we take one as the best, until our own experience confirms it or proves it otherwise. I am cultivating tobacco, and naturally side with the writer in favor of its culture, deeming it, from my little experience, not only a present-paying crop, but as the best mode of cultivating our lands so as to produce, by proper rotation of crops, the largest yield in future. We know that tobacco requires rich land, and to be thoroughly cultivated, so we are constrained to make all the manure we can possibly, and prevent any waste, to enrich "the tobacco lot," then the land is put in finer tilth than for any other crop and good work always repays, and the cultivation of the plant is so thorough, that after the plants are cut, the land is in the best possible condition for wheat, upon which clover or any grass being seeded, you are sure to get a good stand ot grass, thus keeping your land in an improving condition instead of exhausting it.

If a farmer choose to expend everything in the shape of manures, labor, &c., on his tobacco crop, that is not to be laid to the charge of the crop, but to the want of experience, or the proper system of farming on the part of the farmer. This is an age of progress in the sciences and arts, and in none more so than in mechanism. The improvements in our numerous and varied agricultural implements, enable the farmer of the present day to perform double the work and in better manner, with the same force, than formerly, when the one-kind plough and almighty-hoe, were the sole dependence of the farmer, so that the tobacco crop now is not the "Bane of Husbandry" of former times. Some of the reasons adduced by the writer against tobacco are true and forcible, it is a laborious and pressing crop, more so than any other crop in proportion to quantity of land in cultivation, but does any other crop pay a like return? And does not any paying crop require much labor and care? The crop is not of necessity kept on hand so long as has been stated, for we generally plant from the latter part of May to the 1st of July, and it can easily be bulked down, stripped and prized for market by March or April, and not be in the way of the next crop, or of planting corn. My overseer, who has also read the articles by the two parties, pro and con, and who is a warm advocate for the cultivation of tobacco, has handed me the following as his mode of cultivating my crop and wishes it sent to your magazine.

1st. comes the "Plant Bed."

"For this, select a low, moist place, not wet or springy, and if possible lying to the South and protected on the North and West. If there be growth on it, cut it off and rake the ground clear, then pile on brush, say from three to four feet high, and burn it well and regularly over the bed, then hoe it up directly some three or four inches deep, cut all the roots up clear and rake them off, (a coulter may be used to advantage,) next lay off lands three feet wide, as in wheat; take a table-spoonfull of seed for every hundred square yards, and mix them with a sufficient quantity of fine, dry ashes, so as to enable you to sow the seed more regularly, (it is best to sow over the bed once, and then sow back on it again in reverse) and then trample it in with the feet. If the winter be a hard one, cover directly with open brush, but if of moderate degree, cover up the beds just as the plants come up, and let it remain until frost has well gone, then uncover. Don't use pine or cedar brush, as it renders the plants too sensitive to cold or frost. Guano can be used either when seeding or after the plants are up, it is best to top-dress your plants soon after your plants begin to grow. Should the fly appear, give them a dressing with dry ashes and guano mixed; it acts well, and forces the plants out of the power of the fly.

2nd. The preparation of the land.

If it be a fallow, plow it up in December, or certainly in the early part of the winter, so that the freezing and thawing may mellow the land, and prevent the cut-worm, which would prove very injurious; plow deep and turn the furrow-slice well, then in the spring put on your manure and turn it in, but not deep enough to turn up the old sod, next harrow well and throw up into lists of three feet wide, and chop the hill two and a half feet on the bed. The time for planting is as early as the ground is sufficiently warm and no danger of frost, (the deadly enemy of tobacco,) and when the land is moist, or still better, during a rain if it be not a driving one.

3d. The working of the crop.

As soon as you find the plant has begun to grow, cut down round the plant slightly and then run the side-wipes, next run a single horse-plow and throw the dirt from the plant, next reverse and throw the dirt to the plant. Work it whenever it requires it. After we work it the last time, we begin to prime and top; prime it nigh enough to prevent the rains from bespattering the plant with sand. We begin to top in July and top the first to ten leaves; in August to eight, and afterwards to six. When ripe, cut it and let it lay in the row until well fallen and then remove it to the outer edge of the field and slightly cover it to prevent the sun from burning it, from thence haul it to your scaffold at the tobacco-house, hang from seven to ten plants according to size on sticks, four and a half feet long, and place them on the scaffold as close together as possible for four or five days until they become a mottled yellow, then separate to ten or twelve inches apart, and hang for four or five days more.

4th. The housing, curing and stripping, &c.

It is taken from the scaffold to the House, and the sticks hung from eight to ten inches apart. When it has hung long enough for the little fibres of the leaf to crack, you can then begin to make your first bulk ready for stripping, it must be bulked down when coming "in case" and not when going out "of case." Should the floor of the house be damp or the tobacco mould from long spells of damp or rainy weather, use a little fire of hard wood or charcoal and then cover the floor with straw. It should be assorted and stripped and tied into bundles of six to eight leaves, and the heads wrapped smoothly and the leaves all of the same length in each bundle. After stripping, rehang it, it is afterwards bulked down for prizing, not so high as for stripping. It should be done by a careful hand; it is then prized and marketed at the owner's pleasure."

The above is our plan. We do not claim any originality, but only give you our method by which my crop has been worked with perfectly green hands, and have not found it "the bane of farming."

Tobacco was cultivated in this country many years ago, but, on the price falling, it has not been cultivated but by very few, and only on a small scale until now, many are beginning to cultivate it in my neighborhood. Old Stafford is waking up from her long slumber, and is endeavoring to throw off the stigma of her poor and badly cultivated lands. The yield of wheat, corn, tobacco, &c., bear a fair comparison with some of our richest countries in the State; the the lands are being sold rapidly to new parties, are worked much better and are rapidly improving both in productiveness and value. Rich fields of wheat and clover now greet the eye where sheep-sorrel, hen-grass and water-weeds and craw-fish holes once had possession. Our wheat crop this season is so far a fine one, but the joint-worm has attacked it in the last week and is doing serious injury; our corn has come up finely and growing rapidly; most of our tobacco was set out during last week's rainy spell, and nearly every one seems to be alive and budding out. Some of our fruit was killed by the late frosts, but we will have a fair quantity still. My garden is one of the finest I have seen and paying me well for my outlay in actual money, to say nothing of the pleasure and other benefits derived from it; I work it on the "high pressure" system and succeed well. Our valley is up and doing, and presents to the eye of the passerby a rich and beautiful sight.

Wishing your valuable "Planter" in the hands of every farmer, and your pockets filled with its subscription price,

I remain, respectfully,

"POTOMAC VALLEY."

Small Pens for Fattening Pigs.

This is a matter of much more importance than might appear at first glance. Our attention has been called to it by an uneasy, frisky sow, that we had occasion to purchase in September. She had enjoyed the run of a pasture during the summer, and was thin in flesh. We put her into a large pen, about twelve by thirty feet, and though she had fattening food in abundance, she kept so constantly upon the move, that the food seemed to help her very little. She had a comfortable, dry sleeping apartment, with plenty of hay, but if she slept well by night there was no rest by day. After several weeks of this regimen, we yarded off a corner of the pen, making it about eight feet square. Her errant propensities were cured at once, she takes her rations with decided gusto, and sleeps well between meals. There was a rapid increase of flesh and fat soon after the close yarding.

From observations extending over a dozen years or more, made in villages and in the rural districts, we have noticed that the fattest and best pork is make in the former, where one or two pigs are usually kept in a small pen. The villager has but a small room, and crowds his pig into narrow quarters for the whole year. It is fed on slops for eight months, and for the last four is crammed with scalded Indian meal. He gets pork of decidedly better quality than he can purchase, and gets it cheaper. The whole energy of the animal is forced, by his training, into the production of flesh and fat.

The pigs of the farmer, on the other hand, run in a pasture, or on the common, for six or eight months, and are shut up, a dozen or more, in a large pen to fatten, because he has plenty of room. The energy of the animal has gone very much to the development of snout and feet, and the propensity to run and to root is not circumscribed very much in his roomy pen. By Christmas he is not more than two-thirds fattened, and he has consumed quite as much as the village pig, which is ready for the knife. We have two yearling pigs, good for four hundred and fifty pounds of pork by Christmas, that have never been out of a pen, eight feet by twelve, since they were eight weeks old. Small pens, kept dry, and regular feeding, is the secret of their thrift.—*American Agriculturist.*

Education.

If I were to reduce to a single maxim the concentrated wisdom of the world on the subject of practical education, I should but enunciate a proposition which I fear, is not incorporated as it should be into the practice of schools and families. That principle is, that in educating the young, you serve them most effectually, not by what you do for them, but what you teach them to do for themselves. The popular opinion seems to be that education is putting something into the mind of a child, by exercising merely its power of receptivity, its memory. I say nay. The great principle on which a child should be educated, is not that of reception, but rather that of action, and it will ever remain uneducated, in the highest sense, so long as its higher mental powers remain inert. It was well said by the eminent Dr. Mason, "Let the aim of education be to convert the mind into a living fountain, and not a reservoir." That which is filled by merely pumping in, will be emptied by pumping out.

Renovation of the Peach Tree.—The Editor of the New England Farmer says that a gentleman residing in Cambridge informs him that charcoal placed around the roots of diseased peach trees was valuable. He immediately removed the soil from around the trunk of a sickly tree in the garden, supplied its place with charcoal, and was surprised at its sudden renovation and subsequent rapidity of its growth, and the tenacity with which the fruit held on the branches and the unusual richness of its flavor when matured.

White Wash for Fences.—One ounce of white vitriol (sulphate of zinc,) and three ounces of common salt, to every three or four pounds of good fresh lime, will render it durable where it is exposed to the weather.

Receipts from a Lady.

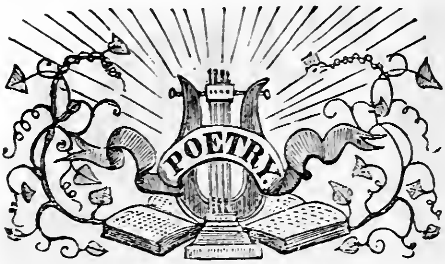
A lady friend has sent us the following receipts for making lemon pies and French honey, which we publish with great pleasure in the *Telegraph:*

Lemon Pie.—The juice and rind of one lemon; one cup of water; one tablespoonful of corn starch; one cup of sugar; one egg, and a piece of butter the size of a small egg, for one pie. Boil the water; wet the corn starch with a little cold water; stir it in until it boils up; pour it upon the butter and sugar; after it cools, add the egg and lemon, and bake with an upper and lower crust.

French Honey.—One pound of white sugar · six eggs, leaving out the whites of two; the juice of three or four lemons, and the grated rind of two, and a quarter of a pound of butter. Stir over a slow fire until it is about the consistency of honey.

Silver and Silver-Plated Articles.

The readiest mode of cleaning these articles is to wipe them over with a weak solution of liquid ammonia. This readily removes the sulphide, and no rubbing, or scarcely any is required—the same agent will be found useful in cleaning gold chains and jewelry.



Human Grief.

The sharpest thorn protects the sweetest rose,
 The sweetest rose is sweeter crushed,
On darkest clouds the brightest stars repose,
 And music's softest strains in cat'racts hush'd.

Its precious juice the *trodden wine-press* yields;
 The udder *pressed*, its pleasant food;
Rich harvests in *deeply furrow'd* fields:
 The *smitten* rock pours out the colling flood.

Our human griefs, not always wisely felt,
 Than joys, are often more our friends;
The dross abides in hearts that never melt;
 To tears the rainbow oft its radiance lends.

Prophetic Hope illumes the gloom of grief;
 The furrowed heart *its* harvests bears;
The angel reapers gather in the sheaf
 Of golden grain, grown in the field of cares.

O weeper! on the weary way of life,
 Look on thy suffering CHRIST, and SING!
A moment more of sorrow and of strife,
 And thou art garnered from the winnowing!

Childhood.

Childhood, sweet and sunny childhood,
 With its careless, thoughtless air,
Like the verdant, tangled wildwood,
 Wants the training hand of care.

See it springing all around us—
 Glad to know, and quick to learn;
Asking questions that confound us;
 Teaching lessons in its turn.

Who loves not its joyous revel,
 Leaping lightly on the lawn,
Up the knoll, along the level,
 Free and graceful as a fawn!

Let it revel; it is nature
 Giving to the little dears
Strength of limb, and healthful features,
 For the toil of coming years.

He who checks a child with terror,
 Stops its play and stills its song,
Not alone commits an error,
 But a great and moral wrong.

Give it play, and never fear it—
 Active life is no defect:
Never, never, break its spirit—
 Curb it only to direct.

Would you dam the flowing river,
 Thinking it would cease to flow?
Onward it must go forever—
 Better teach it where to go.

Childhood is a fountain welling;
 Trace its channel in the sand,
And its currents, spreading, swelling,
 Will revive the withered land.

Childhood is the vernal season;
 Trim and train the tender shoot;
Love is to the coming reason
 As the blossom to the fruit.

Tender twigs are bent and folded—
 Art to nature beauty lends;
Childhood easily is moulded;
 Manhood breaks, but seldom bends.

DAVID BATES.

One by One.

One by one the sands are flowing,
 One by one the moments fall;
Some are coming, some are going,
 Do not strive to grasp them all.

One by one thy duties wait thee,
 Let thy whole strength go to each,
Let no future dreams elate thee,
 Learn thou first what these can teach.

One by one (bright gifts from Heaven)
 Joys are sent thee here below;
Take them readily when given,
 Ready too to let them go.

One by one thy griefs shall meet thee,
 Do not fear an arméd band;
One will fade as others greet thee,
 Shadows passing through the land.

Do not look at life's long sorrow;
 See how small each moment's pain;
God will help thee for to-morrow,
 Every day begin again.

Every hour that fleets so slowly
 Has its task to do or bear;
Luminous the crown, and holy,
 If thou set each gem with care.

Do not linger with regretting,
 Or for passing hours despond;
Nor, the daily toil forgetting,
 Look too eagerly beyond.

Hours are golden links, God's token,
 Reaching Heaven; but one by one
Take them, lest the chain be broken
 Ere the pilgrimage be done.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

VOL. XIX. RICHMOND, VA., JULY, 1859. No. .

For the Southern Planter.

Guano Controversy.

MR. EDITOR:

I am at a loss for a "caption" to this article, that will designate my subject at present, and still bear some relation to the original inquiry, out of which these collaterals have sprung. One would scarcely suppose from the points now under discussion between your correspondent "B." and myself that the discussion had its beginning in an inquiry into the "Stimulating properties of Guano;" and yet the connection is natural, inasmuch as its operation for good or evil depends in a great degree upon the susceptibilities of vegetables to these unwonted effects. And thus we are led off into a physiological discussion concerning the susceptibilities of plants, and as susceptibilities imply functions and functions organs, it brings us directly to the question, Do plants possess an organization analagous to the nervous system of animals?

Says "B.," "I have not asserted that there exist an organized nervous system, but such susceptibilities as sustain to the vegetable, a relation similar to that of a nervous system to animals." The meaning we extract from the foregoing sentence is, that plants either possess a nervous apparatus or some organized structure whose functions bear a certain relation to the functions of a nervous system: for what he calls susceptibilities must be the properties or functions of some organ from which it derives its susceptibilities.

Now, if he hesitates about calling it a nervous system, we must call upon him for a name for this new structure in the anatomy and conformation of plants, and then to demonstrate its functions and show us its relations to this system in animals.

In the meantime, we will endeavour to show that plants do not possess certain functions or properties that are possessed by all animals, in greater or less degree, and that are universally referred by all physiologists to an organized system of nerves, viz: sensation and locomotion. "B." stated in syllogestic form in a previous communication, that as some animals do not possess locomotion, they, too, must be destitute of nerves; but we deny the fact that there are any animals totally destitute of either of these functions. We are ready to admit that they are very feeble and of the lowest order, but that they are *totally absent* no physiologist has ever asserted. In the higher orders of animal existence, both the functions and their organs are so palpable as to be readily demonstrated, and always bearing the relation to each other of cause and effect; so that in the oyster and zoophytes, and other specimens of feeble animal existence, where the nervous system is too rudimental to be demonstrated, we have a perfect right to infer its existence from the presence of its functions.

Now, what evidence is there that plants possess either sensation or locomotion? I believe it has never been asserted that they have the least pretension to locomotion, (except by the learned and distinguished physiologist from whom "B." quotes, and to whom we will refer again;) and as locomotion and sensation go hand in hand, and always co-exist in the relation of cause and effect; in the absence of the one there is no need of the other, and in the absence of both there is no need of the organization that produces and presides over them. Had Nature endowed plants with such organs and functions, she, in all probability, would have made them to stand out in the same bold relief in the one kingdom as in the other. In all other respects she has constructed plants with their organs and functions as conspicuous as those of the animal kingdom. As animals were certainly designed for one purpose and vegetables for another, why can we not accept these higher attributes of sensation and locomotion as the distinguishing characteristic—the beginning, at least, of a separation of the animal from the vegetable kingdom. To answer the ends of vegetable life, there is no need of such functions or such organs, whilst they are indispensable to animal existence. Every motion in the animal organism proceeds from the nervous apparatus. The phenomena of motion in the vegetable, as the circulation of the sap, and the closing of leaves and flowers, depend on physical and mechanical laws. Heat and light are the remote causes of motion in vegetables, their growth and development, and also the assimilation of their food, being dependent upon external circumstances and influences which produce motion. There are two sets of circumstances necessary to produce any activity in vegetables, viz: the presence of matter for assimilation and of heat and light; the increase of the plant being dependent upon the presence of material out of which its food can be elaborated through the operation of these indispensable agents; but heat and light are powerless of themselves without the presence of something upon which to operate. There is no organ in the plant whose functions they (that is, heat and light,) can in the slightest degree increase, without the presence of pabulum to act upon, and when this pabulum is elaborated, assimilation goes on under the control of a "*vis vitæ*," and growth and development are the necessary consequence.

In animals, on the contrary, we recognize a distinct power residing in a nervous system capable of renewing itself at every instant of life—a power peculiar to themselves—self-generating, depending upon none of those external influences to which vegetables are subject as the source of their motion, a mere operation of the will being sufficient to develop it and to produce the motion which is indispensable to the vital process. Joy or anger excites it, and disturbs its equilibrium. The action of "mere stimulants" produces the intensest activity, without any increase or development whatever.

Says "B.," "The gentleman will scarcely deny that when the vital forces or actions of plants are exalted or quickened, that the circulation of the nutritious juices in the plant are at the same time accelerated." In reply to which we say that "B." but makes the common mistake of putting the cart before the horse, or mistaking the effect for the cause. The acceleration of the nutritious juices, consequent upon an abundant supply; that is elaborated under the influence of heat and light, is what exalts and quickens the vital forces or actions.

"B." informs me "I am mistaken in supposing alcohol innoxious to plants, and that I will be convinced of the mistake by pouring strong brandy on a delicate plant." I am rather opposed to wasting the material by such an experiment. Could he have been so indiscreet as to put his to such a vile purpose? If he will inform me how I can persuade his little nervous membranes to "*imbibe* a mouth-full," I would consent to spare as much: but I can't stand this pouring on, as I would not only waste my brandy, but burn my plant, though not quite so effectually as by using a strong acid, or fire, the effect of each and all such agents being to destroy the structure partially or wholly according to the degree of concentration by a chemical action. If I could direct a little "spirits and water" internally to its susceptibilities, I would sacrifice a little of the "over-joyful" to see a drunken plant. He also informs me that brandy is not a "mere stimulant" to animals, though it be the type of the class of "mere stimulants," from which I infer, he means, that while plants are susceptible to the action of "mere stimulants," animals are not. How is it with hope, and joy, and anger? Are they fattening also? But I hate to give up the brandy; and I know that "B." has the good taste to like it, too,—for he says that "it is destruction to rose bushes, but as fattening as Cod-liver to man," which we in all our admiration must doubt; and we will hazard our opinion that, if "B." will go it on brandy alone for one month his "fair, round belly and good caponed loin" will vanish into the lean and lank Cassius form.

Again he asks, "How does the gentleman know that all the positive phenomena of such action (stimulant) are found in connection with such a known system of nerves." Because I have never known the application of any stimulant to anything without nerves to produce phenomena in accordance with the functions of a nervous apparatus, and the manifestations of the functions of a nervous apparatus are what I call "the positive phenomena."

"B." quotes from a "learned and distinguished physiologist in vegetables" the following remarkable enunciation of facts; but however learned and distinguished his authority may be, he must excuse us for asking for the proof. An "ipse dixit," is one mode of imparting knowledge and a quod erat demonstrandum" is another. And where propositions are new and startling, we of little faith require the latter:

"Two properties direct the action of their small number of functions; a *latent* and *faint sensibility*, in virtue of which, each vessel, every part of the plant is affected in its own way by the fluids with which it is in contact,—a contactility as little apparent, though the results prove irrefragibly its existence; a contactility in virtue of which the vessels sensible to the impression of liquids close or dilate themselves to effect their transmission or elaboration. The organs allotted to reproduction animate, for a moment, this exhibition; more sensible, more irritable, they are visibly in action; the stamina, or male organs bow themselves over the female organs, the pistil shakes on the stigma the fertilizing dust, then straightens, retires from it, and dies with the flower, which is succeeded by the seed or fruit."

So you perceive the learned and distinguished physiologist has not only discovered "a latent and faint sensibility," but also the highest attributes of animal life, consciousness and volition. We can but think that the learned gentleman left the province of philosophical research for that of fancy.

"B." refers, very properly, the agency of heat, in producing such sublime phenomena in the mineral kingdom, to its expansive powers; but supposes it possesses another and distinct power when applied to the vegetable and animal kingdoms. He says, "the potency here excited is an exalting, quickening, life-giving energy." So it is; but how does it do it? We *apprehend*, (if he will permit the expression,) by the agency of the same expansive power elaborating the elements of nutrition out of pre-existing compounds, and when these elements are brought within reach of the assimilating power of vegetables, they produce "an exalting, quickening, life-giving energy."

Heat has but one force and one power, and that is manifested alike upon all bodies and all matter. It is a great disengaging force tending to separate particles of matter, and its antagonistic force is "affinity." Yet it is frequently employed to aid the power of affinity, by presenting matter in a more eligible condition.

We acknowledge the receipt of the "autograph," and must confess to no little anxiety to meet in person the individual (on many accounts) that owns so remarkable a cognomen, and am not surprized that he hesitates to give it to the public. For, were it "Scroggins," it would not be less euphoneous than the veritable "autograph."

W. A. BRADFORD.

Clarke Co., June 8th, 1859.

Sex of Eggs.

A correspondent of an English paper affirms that he learned whilst in France, among the best poultry breeders, that the long narrow eggs were set aside as male eggs, or those that would produce male chickens if hatched out, and that the round dumpy ones would produce female chickens.

Meteorology in its Connection with Agriculture.

An Abridgement of an Article written and published in the Patent Office Report of 1855.

BY JOSEPH HENRY, SECRETARY OF THE SMITHSONIAN INSTITUTION.

All the changes on the surface of the earth, and all the movements of the heavenly bodies, are the immediate results of natural forces, acting in accordance with established and invariable laws; and it is only by that precise knowledge of these laws, which is properly denominated science, that man is enabled to defend himself against the adverse operations of Nature, or to direct her innate powers in accordance with his will. At first sight, it might appear that meteorology was an exception to this general proposition, and that the changes of the weather, and the peculiarities of climate, in different portions of the earth's surface, were of all things the most uncertain, and farthest removed from the dominion of law; but scientific investigation establishes the fact, that no phenomenon is the result of accident, nor even of fitful volition. The modern science of statistics has revealed a permanency and an order in the occurrence of events depending on conditions in which nothing of this kind could have been supposed. Even those occurrences which seem to be left to the free will, the passion, or the greater or less intelligence of men, are under the control of laws, fixed, immutable and eternal. No one knows the day nor hour of his own death, and nothing is more entirely uncertain than, in a given case of expected birth, whether a boy or a girl shall be born; but the number out of a million of men living together, in one country, who shall die in ten, twenty, forty or sixty years, and the number of boys and girls who shall be born in a million of births, may be predicted from statistical data with almost unerring precision. * * * All events are governed by a Supreme Intelligence, who knows no change, and, under the same conditions, the same results are invariably produced. If the conditions, however, are permanently varied, a corresponding change in the results will be observed. * * * It is this regularity which is observed in phenomena, when studied in groups of large numbers, which enables us to arrive at reliable and permanent laws in regard to meteorology, and to predict, with certainty, the average temperature of a given place for a series of decades of years, and which furnishes the basis, in accordance with the principles of assurance, of a knowledge of what species of plant or animal may be profitably raised in a given locality. * * * We need but to unite the results of observations with those of experiments in the laboratory, and mathematical deductions from astronomical and other data, to enable us, not only to refer the periodic changes to established laws, but also to trace to their source, various perturbing influences which produce the variations from the mean, and thus arrive, at least, at an approximate explanation of the meteorological phenomena which are constantly presented to us.

No truth is more important in regard to the material well-being of man, and none requires to be more frequently enforced upon the public mind, than that the improvement and perfection of art depend upon the advance of science. Although many processes have been discovered by accident, and practised from age to age, without a knowledge of the principles on which they depend, yet, as a general rule, such processes are imperfect, and remain, like Chinese art, for centuries unchanged or unimproved. They are generally wasteful in labor and material, and involve operations which are not merely unessential, but actually detrimental. The dependence of the improvement of agriculture upon the advance of general science, and its intimate connexion with meteorology in particular, must be evident, when we reflect that it is the art of applying the forces of Nature to increase and improve those portions of her productions which are essential to the necessity and comfort of the human race.

Modern science has established, by a wide and careful induction, the fact that plants and animals principally consist of solidified air, the only portions of an earthy character which enter into their composition, being the ashes that remain after combustion. All the other parts were originally in the atmosphere, were absorbed from the mass of air during the growth of the plant or animal, and are given back again to the same fountain from which they were drawn, in the decay of the vegetable, and in the breathing and death of the animal.

The air consists of oxygen, nitrogen, carbonic acid, the vapor of water, traces of ammonia, and of nitric acid. A young plant, placed in the free atmosphere, and exposed to the light of the sun, gradually increases in size and weight, and receives carbon constantly from the corbonic acid of the air, which is decomposed, and evolves the liberated oxygen. The power by which this decomposition is produced is now known to be due to the solar ray, which consists of a peculiar impulse, or vibration, propagated from the distant sun, through a medium filling all space.

It is a principle of nature, that power is always absorbed in producing a change in matter. This change may be permanent, or it may be of such a character, as to reproduce the power which was expended in effecting it. * * * For example, the effect of the impulse from the sun is to decompose the carbonic acid which surrounds the leaf of the plant, or, in other words, to overcome the natural attraction between the carbon and the oxygen of which the acid is composed; and, in this effort, the motions of the atoms of the etherial medium are themselves stopped. The power, however, in this case, is not permanently neutralised; for, when the plant is consumed, either by rapid combustion or by slow decay; that is, when the carbon and the oxygen are again suffered to rush into union, to form carbonic acid—the same amount of power is evolved in the form of light, heat, or nervous force, which was absorbed in the original composition. If the plant, moreover, be consumed in the animal, the same power is expended in building up the organization, in producing locomotion and the incessant action of the heart, and the other involuntary movements necessary to the vital process.

Plants are, therefore, the recipients of the power of the sun-beam. They transfer this power to the animal, and the animal again returns it to celestial space, whence it emanated. Properly to so direct this power of the sun-beam, that no part of it may run to waste, or be unproductive of economical results, it is essential that we know something of its nature; and the lifetime of labor of many individuals, supported at public expense, would be well expended in exclusive devotion to this one subject. The researches which have been made, in regard to it, have developed the fact, that the impulses from the sun are of, at least, four different characters, namely, the lighting impulse, the heating impulse, the chemical impulse, and the phosphorogenic impulse; and it has further been ascertained that, though each of these impulses may produce an effect on the plant, the decomposition of the carbonic acid is mainly due to the chemical action. A series of experiments is required to determine the various conditions under which these impulses from the sun may be turned to the greatest amount of economical use, and what modifications they may demand, in order to the growth of peculiar plants. The fact has not yet been clearly ascertained, whether some of these emanations cannot be excluded with beneficial result, or, in other words, whether they do not produee an antagonistic effect, and what relative proportions of them are absorbed by the atmosphere, or reflected from our planet, without reaching the earth, by the floating clouds of the air. To determine these, requires a series of elaborate experiments and accurate observations. We have said that the chemical vibration is that which principally decomposes the earbonic acid, in the growth of the plant; but we know that the heating impulse is an auxiliary to this, and that heat and moisture are essential elements in the growth of vegetation. The small amount of knowledge we already possess of the character of the emanations from the sun, has been turned to admirable account in horticulture. In this branch of husbandry, we seek, even more than in agriculture, to modify the processes of nature; to cultivate the plants of the torrid zone amid the chilling winds of the northern temperate zone; and to render the climate of sterile portions of the earth congenial to the luxurious productions of more favored regions. We seek to produce artificial atmospheres, and to so temper the impulses from the sun, that the effects of variations in latitude, and the rigor of the climate, may be obviated.

From all that has been said, therefore, it will be evident, that the hopes of the future, in regard to agriculture, principally rest upon the advance of abstract science—not upon the mere accumulation of facts, of which the connexion and dependence are unknown, but upon a definite conception of the general principles of which these facts are the result. All the phenomena of the atmosphere should be studied and traced to the laws on which they depend. The labor bestowed upon investigations of this kind is not as, the narrow-sighted advocate of immediate utilitarian results would affirm, without practical importance; on the contrary, it is the basis of the highest improvement of which the art of agriculture is susceptible. On every acre of ground, a definite amount of solar force is projected, which may, under proper conditions, be employed in developing organization; and the great object of the husbandman is, to so arrange the conditions, that the least amount possible of this may be lost in uneconomical results. Independent, however, of the practical value of a knowledge of the principles on which the art of agriculture depends, the mind of the farmer should be cultivated, as well as his fields, and, after the study of God's moral revelation, what is better fitted to improve the intellect than the investigation of the mode by which He produces the changes in the material universe. * *

The climate and productiveness of a country are determined, first by its latitude, or its distance on either side of the equator; second, by the configuration of the surface, as to elevation and depression; third, by its position, whether in the interior of a continent, or in proximity to the ocean; fourth, by the direction and velocity of the prevailing winds; fifth, by the nature of the soil; and, lastly, the cultivation to which it has been subjected.

First, in regard to latitude: The productive power of a soil, other things being the same, depends on two circumstances, solar radiation and moisture; and these increase as we approach the equator.

If the kind of food were a matter of indifference, the same extent of ground which supports one person at the latitude of 60° would support twenty-five at the equator; but the food necessary to the support of persons in different latitudes varies with respect to quality, as well as to quantity, and the other conditions mentioned, with regard to climate, should enter largely into the estimate we form in relation to the actual productiveness of different parallels of latitude.

* * * *

The air diminishes in temperature, as we ascend, but the rate of this diminution varies, within certain limits, in different parts of the earth. * * * * *

We may assume, that in the temperate zone, the diminution due to altitudes, or mountains, is about 1° of Fahrenheit for 300 feet. Furthermore, the air, as we ascend, and the pressure of the superincumbent strata is removed, becomes lighter; and though the temperature of the several portions diminishes very rapidly, yet the whole amount of heat in each pound of air is very nearly the same. For example, if a certain weight of air were carried from the surface of the earth to such a height that it would expand into double its volume, the heat which it contained would then be distributed throughout twice the space, and the temperature would consequently be much diminished, though the absolute amount of heat would be unchanged. If the same air was returned to the earth, whence it was taken, condensation would ensue, and the temperature would be the same as at first.

On this principle, a wind passing over a high mountain is not necessarily cooled; for the diminution of temperature, which is produced by the rarefaction of the ascent, would be just equivalent to the increase which is due to the condensation in an equal descent. This would be the case if the air were perfectly dry; but, if it contained moisture, paradoxical as it may seem, it would be warmer when it returned to the lower level than when it left it. In ascending to the top of the mountain, it would deposit its moisture in the form of water or snow, and the latent heat given out from this would increase the heat of the air, and when it descended, on the opposite side, to the same level from which it ascended, it would be warmer, on account of this additional heat. The configuration of the surface of our continent, on this account, has therefore a marked influence on the temperature of its different parts.

The effect of the position of a country, as regards its proximity to the ocean, on its climate, will be evident from the facts relative to the radiation and absorption of heat by different substances. All bodies, on the surface of the earth, are constantly receiving and giving out heat. A piece of ice, exposed to the sun, sends rays to this luminary, and receives in return a much greater amount. The power, however, of radiating and receiving heat, in different bodies, is very variable. Water, exposed to the same source of heat, receives and radiates far less in a given time than earth; consequently, the land, especially in the higher latitudes, during the long summer days, or during the growing season, receives much more heat than the corresponding waters of the same latitude; and, though the radiation at night is less from the water than the land, yet the accumulating increase of temperature of the latter will be much greater than that of the former. The reverse takes place in the winter. While, therefore, the mean temperature of the ocean and of the land, in the same latitude, may remain the same, the tendency of the land is to receive the greater portion of the heat of the whole year during the months of summer, and thus, by a harmonious arrangement with respect to the production of organic life, to increase the effect of the solar radiation, and to widen the limits within which plants of a peculiar character may be cultivated. Proximity to the sea, however, has another effect on the climate, which depends upon the currents of the former, by which the temperature of the earth, due to the latitude, is materially altered. Heated water is constantly carried from the equatorial regions towards the poles, and streams of cold water returned, by means of which the temperature of the earth is modified, and the extremes reduced in intensity. * * * *

The effect of the prevailing currents of air, on the climate of different portions of the earth, is no less marked than proximity to the sea. * * * * *

Professor Coffin, in his admirable paper on the winds of the northern hemisphere, has shown that, from the equator to the pole, the whole space is occupied by three great belts, or zones, of prevailing wind; the first extends from the equator to an average latitude of 35° north, in which the current is from the northeast, constantly growing less intense as we approach the northern limit; the second is that from 35° to about 60°, the current from the west being more intense in the middle of the belt, and gradually diminishing, almost into a calm, on either side; third, from 60° to the pole, or rather, to a point of greatest cold in the Arctic regions, the wind is in a northeasterly direction.

The first of these belts would constitute what is called the trade winds, produced by the combined effects of the heat of the sun, and the rotation of the earth; the second, is the return trade, and the third, the current which would be produced by an opposite effect to that of the rarefaction of the air by the sun at the equator, namely, the condensation of the air by the cold portion of the earth. The air should flow out, in every direction, from the coldest point, and, combining its motion towards the south with the rotation of the earth, it should take a direction from the east to the west, or become a northeasterly wind.

The effects which these currents must have upon the climate of the United States will be made clear by a little reflection. The trade winds within the tropics, charged with vapor, impinging upon the mountainous parts of South America, in their course towards the west, will deposit their moisture on the eastern slope, and produce a rainless district on the western side. Again, a lower portion of the Atlantic and Gulf trade wind will be deflected from these mountains along the eastern coast of the United States, and through the valley of the Mississippi, as a surface wind, and thus give rise to the moist and warm breezes from the south, of our summers, while the principal or upper portion of the trade wind, or the return westerly current, sweeping over the Pacific ocean, and consequently charged with moisture, will impinge on the coast range of mountains of Oregon and California, and, in ascending its slopes, deposit moisture on the western declivity, giving fertility and a healthful climate to a narrow strip of country bordering on the ocean, and sterility to the eastern slope. All the moisture, however, will not be deposited in the passage over the first range, but a portion will be precipitated on the western side of the next, until it reaches the eastern elevated ridge of the Rocky mountain system, where, we think, it will be nearly, if not quite, exhausted. East of this ridge, and, as it were, in its shadow, there will exist a sterile belt, extending in a northerly and southerly direction many hundred miles. The whole country, also, included between the eastern ridge of the Rocky mountains and the Pacific Ocean, with the exception of the narrow strip before mentioned, will be deficient in moisture, and on account of the heat, evolved, as before shown, by the condensation of moisture on the ridges, will be at a much higher temperature than that due to latitude. This mountain region, and the sterile belt east of it, occupy an area about equal to one-third of the whole surface of the United States, which, with our present knowledge of the laws of nature, and their application to the economical purposes, must ever remain of little value to the husbandman.

According this view, the whole valley of the Mississippi owes its fertility principally to the moisture which proceeds from the Gulf of Mexico, and the intertropical part of the Atlantic ocean. The Atlantic Gulf stream, therefore, produces very little effect in modifying the climate of the northern portion of the United States; first, on account of the cold polar current which intervenes between it and the shore; and secondly because of the prevalent westerly wind. which carries the heat and moisture from us, and precipitates them on the coast of Europe.

The influence of the nature of the soil, on the climate of a country, may be inferred from its greater or less power to absorb and radiate heat, and from its capacity to absorb, or transmit over its surface, the water which may fall upon it in rain, or be deposited in dew. In the investigation of this part of the subject, the observations of the geologist, and the experiments of the chemist and the physicist, must be called into requisition.

In regard to the influence of *cultivation* on the climate of a country, much also may be said, though, at first sight, it might appear that man, with his feeble powers, could hope to have no influence in modifying the action of the great physical agents which determine the heat and moisture of any extended portions of the globe. But, though man cannot direct the winds, nor change the order of the seasons, he is enabled, by altering the conditions under which the forces of nature operate, materially to modify the results produced; for example, removing the forests from an extended portion of country exposes the ground to the immediate radiation of the sun, and increases, in many cases, the amount of evaporation; in other places, it bakes the earth and allows the water to be carried off to the ocean, in freshets, and, in some instances, in destructive inundations.

Drying extensive marshes, or the introduction of a general system of drainage has a remarkable influence in modifying the temperature. The water, which would evaporate, and, by the latent heat thus absorbed, would cool the ground, is suffered to pass through it to the drain beneath, and is thus carried off without depriving the earth of a large amount of heat, which would otherwise be lost. Besides this, the removal of forests gives greater scope to the winds, which are hence subjected to less friction in their passage over the earth.

The whole subject of the removal of forests is one which deserves more attention than it has usually received. In the progress of settlement, it is evident that a great portion of the wooded land of a new country must give place to the cleared field, in order that man may reach the rich harvest of the cereals, which, in his civilized condition, are necessaries, as well as luxuries, of life; yet the indiscriminate destruction of the forests is of doubtful propriety. By the judicious reservation of trees, along the boundaries of certain portions of land in accordance with the known direction of the prevailing wind, the climate, both for the production of plants and animals, within a restricted portion of the earth, may be ameliorated. While, in some parts of the country, the clearing of nearly all the ground is absolutely necessary for agricultural purposes, in others, it may be profitable to allow forests of considerable extent to remain in their pristine condition. Cases of this kind, however, can only be determined by the particular climate of each district of country.

It is now an established truth, that certain locations are screened from miasmatic influence by the intervention of trees. A more general recognition of this fact might add much to the healthfulness of locations in other respects highly desirable.

The solar rays, in passing through the atmosphere, do not heat it in any considerable degree, but they heat the earth against which they impinge; therefore, the temperature of the lower stratum of air is derived, directly or indirectly, from the soil on which it rests; and this temperature as has been remarked will depend upon whether the surface be marshy or dry, clothed with herbage, or covered with sand, clay, or an exposed rock. From this fact it is evident, that man has, in this particular also considerable power in modifying the climate of portions of the earth; and history furnishes us with many examples in which great changes, within human control, have been produced in the course of ages. Ninevah and Babylon, once so celebrated for their advance in civilization and opulence, and Palmyra and Balbec, for their magnificence, offer at this day to the traveller the site of ruins which attest their past greatness, in the midst of desolation. Canaan, described in the Bible as a fertile country, "flowing with milk and honey," is now nearly deprived of vegetation, and presents a scene of almost uninterrupted barrenness. The climate of these countries is undoubtedly modified by the present state of the surface, and might again be ameliorated by cultivation, and, were the encroachments of the sands of the desert stayed, by borders of vegetation of a proper character. Many, parts, even of our own country, which now exhibit a surface of uninterrupted sand, may be rendered productive, or covered with trees and herbage.

A series of observations on the progress of temperature below the surface, in different parts of the country, and even in different fields of the same plantation, would be of value in ascertaining the proper time to introduce the seed, in order that it might not be subjected to decay by premature planting, or lose too much of the necessary influence of summer, by tardy exposure in the ground. This may perhaps be most simply effected, by burying a number of bottles filled with water, at different depths in the ground, say one at the depth of 6 inches, another at 12, and a third at 18 inches. These, in the course of time, would take the temperature of the earth in which they were embedded, and would retain it sufficiently long unchanged, to admit of its measurement, by inserting a thermometer into the mouth of the bottles.

No improvement is more necessary, for rendering the art of agriculture precise, than the introduction into its processes of the two essential principles of science, namely, those of weight and of measure. All the processes in our manufactories, on a great scale, which were formerly conducted by mere guesses, as to heat and quantities, are now subjected to rules, in which the measure of temperature, and the weight of materials, are definitely ascertained by reliable instruments.

The foregoing are general views as to the great principles which govern the peculiarities of climate, and especially that of the United States, the truth of which, in reference to our continent, and the modifications to which they are to be subjected, are to be settled by observations in the future.

In order, however, that the science of meteorology may be founded on reliable data, and attain that rank which its importance demands, it is necessary that extended systems of coöperation should be established. In regard to climate, no part of the world is isolated; that of the smallest island in the Pacific is governed by the general currents of the air and the waters of the ocean. To fully understand, therefore, the causes which influence the climate of any one country, or any one place, it will be necessary to study the conditions, as to heat, moisture, and the movements of the air, of all others. It is evident, also, that, as far as possible, one method should be adopted, and that instruments affording the same indications, under the same conditions, should be employed.

It is true that, for determining the general changes of temperature, and the great movements of the atmosphere of the globe, comparatively few stations of observation, of the first class, are required; but, these should be properly distributed, well furnished with instruments, and supplied with a sufficient corps of observers, to record, at all periods of the day, the prominent fluctuations. Such stations, however, can only be established and supported by the coöperation of a combination of governments.

A general plan of this kind, for observing the meteorogical and magnetical changes, more extensively than had ever before been projected, was digested by the British Association, in 1838, in which the principal governments of Europe were induced to take an active part; and had that of the United States, and those of South America, joined in the enterprise, a. series of watch-towers of nature would have been distributed over every part of the earth.

* * * *

These observatories were established to carry out a series of observations, at the same moment of absolute time, every two hours, day and night, (Sunday excepted,) during three years, together with observations once every month, continuing 24 hours, at intervals of five minutes each. * * * The comparisons of these observations are still in progress, and will occupy the attention of the student of magnetism and meteorology, for many years to come. The system was established more particularly to study the changes of the magnetic needle, and on this subject alone, it has afforded information of sufficient importance to repay all the labor and time expended on it. It has shown that the magnetic force is scarcely constant from one moment to another, that the needle is almost incessantly in motion, that it is affected by the position of the sun and moon, and by perturbations, connected with meteorological phenomena, of a most extraordinary character.

In regard to meteorology, this system furnished reliable data for the great movements of the atmosphere, and the changes in its thermal and hygrometric condition. But, to obtain a more minute knowledge of the special climatology of different countries, it is necessary that a series of observations, at a great many places, should be continued through a number of years, and at stated periods of the day—not as frequent as those of the observations we have mentioned, but embracing as many elements, and even adding to these, as new facts may be developed, or new views entertained. In many countries, accordingly, provision has been made, by their respective governments, for continued though local systems of this kind. The government of Prussia appears to have taken the lead in this important labor, and its example has been followed by those of Great Britain, Russia, Austria, Bavaria, Belgium, Holland and France. In these countries, regular and continuous observations are made, with reliable instruments, on well-digested plans.

Though the government of the United States took no part with the other nations of the earth, in the great system before described, yet it has established and supported for a number of years a partial system of observation at the different military posts of the army. Among other duties assigned to the surgeons, at the suggestion of Surgeon General Lovell, was that of keeping a diary of the weather, and of the diseases prevalent in their vicinity. The earliest register received, under this regulation, was in January, 1819. The only instruments at first used were a thermometer and wind-vane, to which, in 1836, a rain-gauge was added. The observations were made at 7 A. M. and 9 P. M., and the winds and weather were observed morning, noon and evening It is to be regretted that, in 1841, the variable hour of sunrise was substituted for that of 7 A. M., since the latter admits of an hourly correction which cannot be applied to the former, except at the expense of too great an amount of labor.

* * * *

At the commencement of 1843, an extension of the system was made, by the introduction of new instruments, and an additional observation to the number which had previously been recorded, each day, and hourly observations for twenty-four hours were directed to be taken at the equinoxes and solstices.

During the past year, a quarto volume has been published, which contains the results of the observations of the thermometer, direction and force of winds, clearness of sky, and fall of rain and snow, during a period of twelve years, from the first of January, 1843, to January, 1855, arranged in monthly tables and annual summaries. To these are added consolidated tables of temperature and rain, for each separate station, comprising the results of all the thermometric observations made by medical officers since 1822, and of all measurements of rain and snow, since the introduction of the rain-gauge, in 1836.

The tabular part of this volume contains the most important results of the observations of the Army system of registration, and will be considered the most valuable contribution yet made toward a knowledge of the climatology of the United States. Truth, however, will not permit us to express the same opinion in reference to the isothermal charts which accompany this volume. These we consider as premature publications, constructed from insufficient data, and on a principle of projection by which it is not possible to represent correctly the relative temperatures in mountainous regions.

With the learning and zeal for science possessed by the officers of the United States Army, and the importance which they attach to meteorology, in its connection with engineering and topography, it is hoped that this system may be farther extended and improved, that each station may be supplied with a compared thermometer and psychrometer, and that, at a few stations, a series of hourly observations may be established, for at least a single year. The present Secretary of War, we are assured, would willingly sanction any proposition for the improvement of this system, and we doubt not the Surgeon General is desirous of rendering it as perfect as the means at his disposal will permit.

A local system of meteorological observations was established in the State of New York, in 1825, and has been uninterruptedly continued from that time until the present. Each of the academies, which participated in the literature fund of the State, was furnished with a thermometer and rain-gauge, and directed to make three daily observations relative to the temperature, the direction of the wind, cloudiness, &c. The system was remodelled, in 1850, so as to conform to the directions of the Smithsonian Institution, and a considerable number of the academies were furnished with full sets of compared instruments, consisting of a barometer, thermometer, psychrometer, rain-gauge and wind-vane.

A summary of the results of the observations from 1826 to 1850, inclusive, has just been published by the State of New York, under the direction of the Regents of the University. They are presented in the form of a quarto volume, to which is prefixed a map of the State, showing the direction of the wind, and the position of each station. This volume, the computations for which were made by Dr. Franklin B. Hough, is also a valuable contribution te meteorology, and does much credit to the intelligence and perseverance of those who introduced and have advocated the continuance of this system, and to the liberality of the State which has so long and so generously supported it.

* * * *

A system of meteorological observations was established by the Smithsonian Institution, in 1849, the principal object of which was to study the storms that visit the United States, particularly during the winter months. This system, which has been continued up to the present time, was afterwards extended, with a view to collect the statistics necessary to ascertain the character of the climate of North America, to determine the average temperature of various portions of the country, and the variations from this at different periods of the year. It was intended to reduce, as far as possible, to one general plan, the several systems of observations which had previously been established, and to induce others to engage in the same enterprise. But it was, in the first place, desirable, in order that the results might be comparable with those obtained in other countries, that the instruments should be more accurate than those which might be requisite for the mere determination of the phenomena of storms. The institution, therefore, procured standard barometers and thermometers from London and Paris, and, with the aid of Professor Guyot, a distinguished meteorologist, copies of these were made, with improvements, by Mr. James Green, a scientific artist of New York. A large number of these instruments have been constructed and sold to observers. Full sets have been furnished by the Institution to parties in important positions, and, in some cases, half the cost has been paid at the expense of the Smithsonian fund.

A growing taste having been manifestly created for the study of practical meteorology, directions for observations, and a volume of tables for their reduction, have been prepared, and widely circulated at the expense of the Institution. It has also distributed blanks to all the observers of the different systems alluded to, except those of the Army, and has received, in turn, copies of all the observations which have been made. It has, in this way, accumulated a large amount of valuable material, relative to the climate of this country, and to the character of the storms to which it is subjected. The completeness and accuracy of the observations have also increased from year to year; and, by an arrangement which the Institution has now made with the Patent Office, it is hoped that the system will be extended, and its character improved.

It being manifest, from the foregoing statements, and from other evidences, that much interest is awakened in this country on the subject of meteorology, it is hoped that the means may be afforded for reducing and publishing the materials which have been and shall be accumulated, and that important results to agriculture, as well as to other arts, may be hence deduced.—*Abridged from Patent Office Report*, 1855.

Hair of Children.

It is a great mistake to plait the hair of children under eleven or twelve years of age. The process of plaiting more or less strains the hairs in their roots by pulling them tight; tends to deprive them of their requisite supply of nutriment, and checks their growth. The hair of girls should be cut rather short, and allowed to curl freely. When they are about eleven or twelve, the hair should be twisted into a coil not too tight, nor tied at the end with thin thread but with a piece of ribbon.

From the Conservatory Journal.

Adorn!

The law of progress is to adorn. No high state of civilization, moral or religious, has ever been achieved without a corresponding attention to the beautiful. While the world was without form and void, like most of our public places, it was not the abode of man. It was only when it was adorned with sun, moon, and stars, floods, fields, shrubs, and flowers, that he was placed here below, and then it was in a garden. We find nothing in Scripture or history to justify us in believing that man would have been created to this day, if our earth had remained in half the unformed and chaotic state that our public garden was left in for a long time, or, that he would have been created at all, if his eyes were to be greeted with no more beauties than limit the desires of half the people we meet.

Those people, in ancient times, who undertook to live without cultivating the beautiful, have left no name worth possessing behind them. Of Babylon, with its gates of brass and its hanging gardens; of Jerusalem, with its beautiful temple; of Thebes and Athens, and scores of other beautiful cities, conspicuous in the arts and sciences, we have heard and know; but what do we know of the thousand and one other places, alluded to in history, where no talent was cultivated, but the so-called useful? the pitch, tar, and turpentine cities, and hemp and herbs, grass countries, what do we know of them? Nothing, comparatively, nothing! There were Scythians, and Chaldeans, and Medes, and Guelfs, and Ghibelines, and Huns, and Picts, and all very matter-of-fact people, no doubt; quite indifferent to embellishments; who never built any very elaborate temples, nor spent their time on works of art, or laying out parks and promenades. Their works followed them—perished with them; and so will the works of every people who neglect the work of beautifying and embellishing.

There is life, and strength, and power in beauty. A beautiful statue or structure is immortal, because it is beautiful. Amid all the storms of war they are respected. A church or a cathedral, designed and embellished by the hand of a real artist, is a church or a cathedral forever. But how is it with one of our plain—entirely and hopelessly plain—meeting-houses? It is as evanescent as the morning mist. It is far less enduring than a dwelling-house. Now it is a church, now it is a dwelling, and by and by a hostlery, auction shop, or something else equally unsanctified. It wants the grace of dignity and beauty to sanctify and save it. The scholar and antiquary who has read all his days about the beautiful statues, temples, churches, and cathedrals of the old world, and who at last goes abroad to see them, finds the living record still there—memorials of the age of Pericles, of Charlemagne, and of Luther. But, how is it here? Why, the merest school boy can scarcely venture to stay from home a whole term, without danger of finding, when he returns, that his play-ground has been sold to speculators, and that the church of his fathers has been carted away to give place to the counting-house of the trader. Washington Irving, in one of his most humorous views, once gave as a reason why we now hear so little of ghosts, that the spirit of change is going on so incessantly in our villages, that if a poor uneasy ghost does return, and undertakes to walk about his old haunts, he finds everything so changed, that he slinks back to his resting place disgusted, never to attempt it again. If it is not true of ghosts, it is certainly true of those who have settled far away from their native village. One returns to it, to find all the old landmarks swept away, the church where you worshipped, the mall where you played cricket and foot-ball, the school-house—everything—gone, is generally enough for a sensitive mind. Unless you have left near and dear friends behind, there is generally very little to tempt the Yankee boy back to his native home. He cannot rely upon finding one old landmark of his youth respected and standing.

If we want to drive far from us, vice and crime; if we want to outbid the wine cup and the gaming table, we must adorn. We must have paintings and sculpture. We must have something to claim the attention, to mould the taste, and cultivate and elevate the minds and hearts of the people.

Few stop to think how much taste has to do with morals. But there is nothing better established than that slovenly habits beget slovenly morals. All those orders of men who have attempted to ignore taste, and beauty, and elegance, and to go through the world without regard to appearances—such as the Cynics, the mendicant friars, and the like, have all proved conclusively that immorality and ungodliness go hand in hand with habitual untidiness and uncleanliness. Tristam Shandy is by no means the only person who has felt the elevating tendency of a clean shirt. We have before us to-day, a very happy illustration of what taste, beauty, embellishment, and art can do in civilizing and humanizing a people. The steamers have just brought us news of the revolution in Tuscany—the very centre of all that is beautiful in nature and in art. The change of government is effected without tumult, without riot, and without bloodshed; and the deposed monarch is suffered to retire at his leisure, without insult, like any ordinary gentleman. The whole was in harmony with all the surroundings. It was just what ought and might be expected to flow from such humanizing instrumentalities.

CARL.

The First Silk Mill.

One hundred and fifty years ago—according to history—there were no silk mills in England, as there now are; and here I quote from an old book the account how it came:

"The Italians had been long in the exclusive possession of the art of silk-throwing, when about the year 1715, a young mechanic and draughtsman, named John Lombe, undertook the perilous task of visiting Italy, to procure drawings, or models, of the machinery necessary for the undertaking. He remained there some time, and obtained access to the silkworks, by corrupting two of the workmen, through whose assistance he inspected the machinery in private; and whatever parts he obtained a knowledge of in these clandestine visits, he recorded on paper before he slept. When his plan was just completed his intention was discovered, and he was compelled to seek the safety of his life by a precipitate flight into England, where he arrived in safety with the two Italians who had favoured his scheme. Fixing on Derby as a proper place for his design, he agreed with the corporation for an island or swamp in the river, on which he erected and established his mill, at an expense of nearly £30,000, ($150,000,) which charge he enabled himself to defray, by the erection and employment of temporary machines in the town hall and other places, before the completion of his great work. In 1781 he procured a patent for fourteen years, to secure the profits arising from his address and ingenuity. But his days verged to a close; for before half this period had elapsed, treachery and poison had brought him to his grave. The Italians, whose trade began rapidly to decrease, were exasperated to vengeance, and resolved on the destruction of the man whose ingenuity had thus turned the current of their business into another channel; this they accomplished through the machinations of an artful woman, sent from Italy for that purpose. But though suspicion was almost strengthened into certainty from the circumstances that transpired on her examination, yet, evidence being indecisive, she was discharged. The death of this lamented artist did not, however, prove fatal to his patriotic scheme; for the machinery was in full action, and the business became every day more successful. John Lombe was succeeded by his brother William, who committed suicide; on which the property devolved to his cousin, Sir Thomas Lombe, who, previous to the expiration of the patent, petitioned Parliament for its renewal; but the legislature, wishing to reward the promoters of national benefit, and, at the same time, to spread the knowledge of so useful an invention, granted him £14,000, ($70,000,) in lieu of a new patent, on condition that he would suffer a complete model of the work to be taken and deposited in the tower for public inspection, which was accordingly done. The extensive fabric occupied by the machinery stands upon high piles of oak doubly planked, and covered with stone work, on which are turned thirteen arches, that sustain the walls. Its whole length is one hundred and ten feet, its breadth thirty-nine feet, and its height fifty-five and a half feet; it contains five stories, besides the under-works, and is lighted by four hundred and sixty-eight windows. The whole of this elaborate machine, comprising about 14,000 wheels, is put in motion by a water-wheel, thirty-three feet in diameter."

Such was the first silk mill in England, and the circumstances under which it was erected.—*Wes. Chr. Advocate.*

From the Southern Rural Gentleman.

Less Land and Better Culture.

Large farms appear to be the planters highest ambition. "More land, more land is the perpetual cry." And every farmer seems to be stretching his arms for a larger area. As a consequence the lands of the smaller farmer are sold to his richer neighbor, and he goes farther West, where lands are cheap, to acquire larger farms. Now what is the effect of all this craving of more land. It certainly leads to a great waste of the soil, and a great diminution of the crops. Buy land and wear it out, buy more land and strip it of all its fertility and turn it out, and thus the process of exhaustion goes on from year to year. Without a great change and a great improvement, our lands will soon be stripped of their fertility, our country become sterile and barren, and much of our best population driven towards the setting sun.

Belgium has the reputation of the best farming in the world. It is more highly cultivated, and sustains a more dense population than any other country in Europe—there fifteen acres is called a respectable farm. "The poorest in America, when the average for the whole country exceeds one hundred and twenty-five!" What makes the difference? The Belgian improves his soil by constant manuring—he husbands his resources—saves his manure and makes his soil richer every year, so that to day it produces twice or thrice as much as when reclaimed from its native forest. But with us the land is *scraped over* until it has lost its fertility, and then we must push westward in pursuit of new lands. *The process of skinning our lands*, and getting miserably poor crops should be abandoned, and planters should content themselves with farms of such size as they can thoroughly cultivate and improve. We have only to look to the older States to see the effect of this process of *skinning* the land—it has caused them to loose much of their best population, and, in some of them, more than half the increase of the slave population goes off annually to the new States. They have scraped and impoverished their lands, until the slave labor cannot be profitbly employed on their worn out fields, and they are sent to the Southwest. More than ten thousand slaves have been sold in the Charleston market alone! Why? prices are good and the improvement of the soil has not kept pace with the increase of the slave population—they have no new lands to bring into cultivation, and the labor cannot all be profitably employed. Hence they must be sent Southwest where lands are cheap and plenty. Over one Railroad more than fifty thousand slaves passed in the last six or eight months to the Southwest in search of better lands, or to supply the demand for labor by those who wish to increase their farms. How long will it take the constantly increasing slave labor of the Southwest to clear up and reduce much of our rich land to sterility and barrenness? We might just as well expect our horses and mules to live without food to supply the waste of their physical strength and vital energies, as to expect that our lands will continue to produce good crops without manure, to supply the exhausted fertility of the soil, produced by constant cultivation. Besides, this miserable plowing and shilly-shally cultivation is a great waste of labor and *never pays*. If we would turn our attention to manures, and the improvement of our soil, and carefully husband every source of fertility to increase the productiveness of our lands, and give them more thorough cultivation, we should be rewarded with more abundant crops. The successful experience of Mr. McCloud, of Alabama, shows what may be done—that each acre of our land by manures and judicious cultivation may be made to double its production, and that if our farmers would turn their attention to the improvement of their lands, they would be rewarded and well paid for their labour. On many farms what unsightly, worn-out fields are seen—fields washed into gullies and ruined by bad cultivation. It is time for us to abandon this ruinous system and to save our lands and enrich them, and this can be done only by cultivating less land and improving it. But all argument on this subject is unnecessary—it is plain and apparent to all, and we now reiterate our caption, *let us have less land and better cultivation.* *

It you don't want to spoil your children, you may have to spoil a good many rods in raising them.

It is said that corn is so sensitive that it is *shocked* at the approach of Jack Frost.

God had rather see his children humble for sin, than proud of grace.

The Robin.

At a meeting of the Massachusetts Horticultural Society, early in 1858, a resolution was introduced, authorizing the President of that Society to petition the Legislature for a repeal of the laws prohibiting the killing and destroying of the robin. This motion was laid on the table, but a committee was appointed to investigate and learn the habits of the robin, and report. This committee reported March 5th, 1859.

We give in brief the result of the committee's investigations, as reported by its chairman, Prof. J. W. P. Jenks, and found in the Society Journal:

1. Early in March numbers of this bird made their appearance in this vicinity; but until the second week in April, only the male birds.

2. The gizzards of those killed in the morning were, as a general rule, either entirely empty, or but partially distended with food, well macerated, while those killed in the latter part of the day were as uniformly filled with food freshly taken.

3. From the almost daily examination of their gizzards, from the early part of March to the first of May, not a particle of vegetable matter was found in the gizzard of a single bird. On the contrary, insects in great variety, both as to number and kind, as well as in every variety of condition as to growth and development, were the sole food.

But nine-tenths of the aggregate mass of food thus collected during this period consisted of one kind of larva, which, through the aid of Baron Ostensacken, Secretary of the Russian Legation at Washington, I was enabled to identify as the Bibio Albipennis, whose history and habits, by the aid of Dr. Asa Fitch, entomologist of the New York State Agricultural Society, I was enabled to make out quite satisfactorily.

From one to two hundred of this larva were frequently taken from a single gizzard, all in fresh, unmacerated condition; and usually, when this larva was found, it was the only food in the stomach.

4. During the month of May, the Bibio larva entirely disappeared from the gizzards, but up to the 21st of June, was replaced by a variety of insects or worms only, including spiders, caterpillars, and beetles of the family Elateridæ, the parents of the well-known wire-worms, so destructive to corn and various other seeds when committed to the ground.

The earth worm I found to be a favorite food for the young bird, but sparingly employed by the adult for its own use.

5. From the date of June 21st, I began to find strawberries, cherries, and pulpy fruit generally, but in a majority of the examinations intermingled with insects, which led me to conclude that they were not fond of an exclusively vegetable diet, but rather adopted it as a dessert, and from the ease of procuring it, particularly during the enervating season of moulting. At this season of the year, I discovered a marked difference in the food of the birds killed in or near the village and those killed in the country at a distance from gardens and fruit trees, the latter having less of stone fruit and more of insects in their gizzards, which led me to conclude that the robin is not an extensive forager.

6. The mixed diet of the robin seems to continue from the ripening of the strawberries and cherries to October, the vegetable portion consisting during August and September, in great part, of elderberries (Sambucus canadensis) and pokeberries (Phytolacca decandra.)

7. During the month of October the vegetable diet is wholly discarded, and its place supplied by grasshoppers and orthopterous insects generally.

8. Early in November the robin migrates southward—the few remaining eking out a miserable existence during the winter months on bay berries (Myrica ceritera,) privet berries (Ligustrum vulgare,) and juniper berries (Juniperus communis.)

From the Cotton Planter and Soil.

Hill-Side Ditching.

Dr. Cloud—*Dear Sir:* You could not have made a more valuable contribution to the pages of your Journal than the essay of of Mr. Hardwick, on the subject of hill-side ditches. No one in Georgia has done so much to check our wasteful and reckless system of culture. He was among the first to introduce hill-side ditches and horizontal plowing, and we are indebted to his enlightened experience for much of our knowledge on this subject.

Our mode of adjusting the level with the veiw of obtaining the desired grade, differs from Mr. Hardwick's plan, and I will endeavor to explain it to you. It is not original with me, and may be familiar to many of your readers.

The spirit level is attached to the cross bar of the common rafter level by means of a screw, so that when the top or upper surface of the spirit level is even with the top of the cross bar, and the bubble settles in the centre, a perfect level is obtained. Thus adjusted, the level is ready for laying off horizontal guide rows. To obtain the grade you wish your ditches to have, obtain first the true level and place an inch block under it, press one end of the spirit level below the top surface of the cross bar, until the bubble settles in the centre, and make a puncture or mark *on the side bar*, exactly even with the top surface of the depressed end of the spirit level. If your grade is two inches, place a two inch block under one foot and press down the spirit level until the bubble again stands in the centre, and make a puncture or mark on the cross bar. And in the same way make your marks on the cross bar to correspond with a grade of three, four or five inches. Your level is now ready for laying off your ditches. If you wish to give them a grade of three inches, which I believe is usual in a twelve feet stride of a rafter level, you have nothing to do, but to press down one end of the spirit level as low as mark number 3, screw it tight, and when the bubble stands in the centre you have the desired grade, or as near an approximation to it as is necessary for your purpose. This plan dispenses with Mr. Hardwick's grade blocks which are fastened by screws to one of the side pieces of his rafter level. You can, without any inconvenience or delay, change your grade so as to adapt it to different ditches or the same ditch, if the diversity of the soil or any other cause should render a change of grade necessary. I do not present this mode of adjusting the level as a new or an original design, but because I consider it more simple and convenient than any which I have seen suggested. A Planter.

From the Ohio Farmer.

The Law of Sex.

Mr. Editor.—Occasionally there has appeared in the columns of your paper, articles and paragraphs relating to the law which determines the sex of animals, though I believe nothing very definite or satisfactory has been written.

It seems to be a question which a majority of persons consider a mystery which cannot be fathomed; while those who do speculate upon the subject generally arrive at conclusions that are as unreasonable as to attribute it to the result of chance alone.—There is no reason, however, why this function of the animal economy is not governed by laws as well as any other function of the body, nor any reason why the law should not be discovered.

I have lately been looking over a work by a German author, which contains some views on this subject not generally known. He claims to have demonstrated the truth of his propositions by numerous experiments.—With your permission, I will give a synopsis of the law as laid down by him.

His theory is that each testicle or gland yields a peculiar fluid, the right one the male, and the left one the female. Also that the ovaries contain their peculiar ovum; the right ovary forming the ovum for the male, and the left one for the female. And, further, that the ovum from the right ovary can only be impregnated by the seminal fluid from the right gland and *vice versa*.—His experiments seem to verify the theory. A sow, bred to a boar with the right gland removed, bore only female pigs, though the experiment was several times repeated.—Several dogs had their right glands removed, and they invariably begat females. The same was true of rabbits when the left one was removed, the results were opposite, without exception.

On the other hand, he several times removed the right or left ovary from the female, and though bred to perfect animals, the results were the same. No female became pregnant, if bred to a male, the loss of whose gland did not correspond to that of the missing ovary.

If these things are true they can easily be demonstrated by farmers who have any curiosity to gratify, or any interest in the matter, by a few *carefully conducted* experiments.

Let the experiments be made and the results given. The theory certainly looks much more plausible than anything which has hitherto been given to the public upon the subject. M. L. H.

Judge thyself with a judgment of sincerity, and thou wilt judge others with a judgment of charity.

A Statistical View of American Agriculture.

ITS HOME RESOURCES AND FOREIGN MARKETS, &C.

An Address delivered at New York, before the American Geographical and Statistical Society, on the organization of the Agricultural Section.

BY JOHN JAY, ESQ.,

Chairman of the Section, and Foreign Corresponding Secretary of the Society.

[CONCLUDED FROM PAGE 333.]

The census of 1840 did not ascertain the number of acres of improved land in the United States, so that there are no data showing the increase during the last decade. But looking at the produce of American agriculture, we find in the report of the Secretary of State, for 1856, the following:

Statement, exhibiting the number of acres employed in the production of the different crops in the States and Territories, their total product and value, together with the product and value per acre, for the year 1850.

Products.	Number of acres.	Product of each crop.	Description.	Value of Crop	Product per Acre.	Value of Products per Acre.
INDIAN CORN	31,000,000	592,071,104	bush'ls	$296,035,552	19 1-10 bush.	$9 55
Meadow or pasture lands—that proportion which is regarded improved and exclusive of hay crop	20,000,000	....	....	....	....	....
HAY	13,000,000	13,838,242	tons	138,382,420	1 1-16 tons..	10 62½
WHEAT	11,000,000	100,485,844	bush'ls	90,437,260	9 1-8 bush..	8 21
OATS	7,500,000	146,584,179	..do..	51,304,463	19 1-2 bush.	6 82
COTTON	5,000,000	978,319,200	pounds	78,265,376	195 1-2 lbs..	15 64
Rye	1,200,000	14,188,813	bush'ls	9,932,169	11 4-5 bush.	8 26
Peas and Beans	1,000,000	9,219,901	do	6,914,925	9 1-5 bush..	6 90
Irish Potatoes	1,000,000	65,797,895	do	26,319,158	65 3-4 bush.	26 30
Sweet Potatoes	750,000	38,268.148	do	19,134,074	51 bush.....	25 50
Buckwheat	600,000	8,956,912	do	5,374,147	15 bush.....	9 00
Tobacco	400,000	199,752,655	pounds	11,985,159	499 3-8 lbs..	29 96
Sugar	400,000	237,133,000	do	9,485,320	592 4-5 lbs..	23 71
Barley	300,000	5,167,015	bush'ls	3,875.261	17 1-5 bush..	12 99
Rice	175,000	215,313,497	pounds	4,306,270	1,230 2-5 lbs.	24 61
Hemp	110,000	34,871	tons	4,184,520	634 lbs......	38 04
Flax	100,000	7,809,676	pounds	624,774	78 lbs.......	6 25
Orchards	500,000	....	....	7,723,186	....	15 45
Gardens	500,000	....	....	5,280.030	....	10 56
Vineyards	250,000	221,249	gallons	442,498	3 1-2 quarts.	1 77
Other Products	1,000,000					
Improved, but not in actual cultivation	17,247,614					
	113,032,614					

Another Table, from the Compendium of the Census, page 176, giving more fully the values of the Agricultural products of the United States, for 1850, including the annual products of live stock, &c., makes the total for that year thirteen hundred millions, and Mr. De Bow estimated the total for 1854, at sixteen hundred millions.

This table shows us that in 1850 the four largest staples of our country, ranking them according to their annual value, were—

Indian Corn, - - -	$296,000,000
Hay, - - - - - - -	138,000,000
Wheat, - - - - -	90,000,000
Cotton, - - - - -	78,000,000

Before proceeding to note some further statistics in regard to Indian Corn, or as it is sometimes called, *Maize*, let me briefly mention the doubt expressed at a recent meeting of the British Association, whether this grain is strictly a plant of the New World, and allow me to refer to the evidence that proves it, as we think conclusively, to be a native grain.

Stress was laid in the British Association on the fact of its occurrence in the floral decorations of Rome in the time of Rafaelle; but it was said in reply, that botanists had always regarded it as a plant of the New World, and the evidence on this point, adduced by Alfonse De Candolle in his great work on the geographical distribution of plants, was quite complete; and it was sensibly suggested that if it had been a plant of the Old World they could scarcely have failed to raise it, and that Rafaelle's painting it might be accounted for by the interest with which all the products of the New World were then regarded. It is referred to by the most ancient Peruvian historians; it was cultivated by the Aborigines in the time of Columbus, and is still found growing in a wild state from our Rocky Mountains to the forests of Paraguay. The venerable Baron Humboldt, whose eminent authority may be regarded as settling the question, says: "It is no longer doubted among botanists that *Maize*, or Turkish corn, is a true American grain, and that the old continent received it from the new."*

Indian Corn is pre-eminently the great staple of the country, surpassing all others in the area of its cultivation, and in the amount and value of the crop, yielding in 1850, within a fraction of three hundred millions of dollars, being all but equal to the united values of the three next staples in their order, Wheat, Hay and Cotton; and as Indian Corn is not only the most important, but the most universal crop, extending from the northern to the southern limit of the United States; its cultivation would seem to afford a better test than that offered by any other of the progress of American tillage.

In the production of Indian Corn no state has retrograded. The crop in 1840 was nearly four hundred millions of bushels; in 1850 it was within a fraction of six hundred millions, being a gain of 56 per cent., while the increase of the population, during the same time, was only 35 per cent. The estimated crop for 1855, according to the Secretary of the Treasury, was between seven and eight hundred millions, or nearly double the crop for 1840, and the crop for 1856 was estimated at fully eight hundred millions of bushels.

One of our distinguished agriculturists, Prof. Mapes, in an interesting lecture on Indian Corn before the American Institute, has remarked that it may be said of our corn crop, as Mr. Webster said of the turnip crop of England, that its failure for three successive years would nearly bankrupt the nation.

It is with us a staple food of men and of animals. To it we are indebted in part for our beef and in a very large proportion for our pork. In the far West it is fed largely to cattle and pigs for the more convenient exportation of the produce of the country. The number of hogs fattened on it nearly equals the number of inhabitants, and their lard has become a staple article of export. The sugar estates in the West Indies are reported to be mainly supported by American Indian Meal, and its use is extending in Ireland, England, and throughout the world. In 1850, somewhat more than eleven millions of bushels were consumed in the manufacture of malt and spirituous liquors.

While the value of the corn crop has increased so rapidly, the WHEAT crop, from 1840 to 1850, according to the census, had increased only 15 per cent. It was suggested in the report of the Patent Office for 1852 and '53, that this crop would have shown an equal advance with that of Indian Corn, had it not been badly damaged, especially in the North-Western States, before the harvest from which the census was taken; but the statistics of subsequent harvests in particular States seem to render this supposition improbable.

* Those persons who may wish to examine the authorities on both sides of this question, which has been much discussed, will find them arrayed in a learned essay on Indian Corn, by Charles Louis Flint, of Roxbury, Mass., printed in the Transactions of the N. Y. State Agricultural Society, 1849, page 81.

The breadth of land in the United States, suited to the wheat crop, is comparatively small, and in the older States would appear to be diminishing.

In New England the culture of wheat is rapidly declining; in the Middle States it is nearly stationary, the increase for the ten years previous to 1850 being only about 15 per cent. In the North-Western States its culture has rapidly increased; and it is from this district that the largest supplies for export are derived.

Chicago, which, twenty years ago imported flour and meal for her own consumption, has established brands of flour, which are now recognised throughout Europe; and she is shown by recent statistics to be the largest primary grain depot in the world, rivaling Odessa and Galatz, Dantziz and St. Petersburg, while she leads all other ports of the world also in the quantity and quality of her exports.

The population of Chicago, which, in 1850, was 29,000, in 1856 had increased to 104,000.*

The Census of New York, for 1855, shows that her wheat crop, once so famous, is actually decreasing, owing, as it is supposed, in part to the ravages of insects, and in part to diseases of the plant, assisted, perhaps, by a gradual deterioration of the soil.

The wheat crop in New York was twelve millions (12,286,418) in 1840, and only nine millions (9,092,402) in 1855, a decrease of twenty-five per cent., while the crop of INDIAN CORN, in the same State, increased during the same period from about ten (10,972,286) to twenty millions (19,299,691), or nearly one hundred per cent., showing, when taken together, not a diminution in the bread crop of the State, for the joint increase is five millions of bushels, but simply a partial substitution of Indian corn for wheat.

In no country can a bread crop be raised with less labor than Indian corn generally throughout the United States, and it has been estimated that the same amount of toil of a man and horse which will raise a bushel of wheat in England, will raise ten bushels of corn on favorable soil in this country.

The Patent Office Report for 1855, in an interesting paper, by Mr. D. J. Browne,* shows that a comparison of the nutritious values of corn and wheat, ranging at from two to three times the price of a bushel of corn, gives a decided preference to the corn; and this fact has, doubtless, had its influence in extending its consumption among our people.

But as yet neither this fact nor the other excellencies of corn meal are appreciated in Europe; and the exports of this grain are very much less than those of wheat. In 1854 the proportions were $40,000,000 worth of wheat to $7,000,000 worth of corn. Experiments in the preparation of corn are being made by the Government of Prussia, and elsewhere in Europe, which will probably result in its more rapid introduction as a staple article of food.

Looking at the aggregate EXPORTS of the country for the past year, 1857, to learn the proportion due to the culture of the soil, we find them to be as follows:

The Sea - - -	$3,739,644
" Forest - -	14,699,711
Agriculture - -	75,722,096
Tobacco - - -	20,260,772
Cotton - - -	131,575,859
Raw Produce - -	2,103,105
Manufactures - -	30,805,126
Specie and Bullion -	60,078,352

Total value of Exports $338,785,065

of which there was due to the culture of the soil (agriculture, tobacco and cotton,) two hundred and thirty millions (229,661,832), or more than two-thirds of the sum total.

Comparing this amount with the exports due to the culture of the soil in 1847, we

* The shipment of grain in 1855, was 2,200,000 quarters, (of 8 bushels each,) being the largest quantity ever shipped from any one port in the world; 77,000 barrels of pork; 56,000 barrels of beef. A direct trade between Chicago and Liverpool, *via* the St. Lawrence, without transhipment, was successfully opened in 1856, by the Dean Richmond, a schooner of 380 tons register, drawing 9½ feet, with 400 tons of wheat; she was the largest sized vessel that could come through the canal, but it is said that a moderate outlay would admit ships of 1000 tons.

The freight and charges were less than *via* New York, or from the Black Sea. *Mark Lane Gazette.* Letter of Mr. W. Kernaghan, of Dublin, copied VIII. Vol. *Working Farmer*, page 234.

* (See page 456.) The analyses relied upon were those of Sir Humphrey Davy, assigning 95 per cent. of nutritious matter to wheat, and 77 per cent. to corn, determining the intrinsic value of the two grains to be in this proportion; so that $1 being the price of corn, wheat would in reality seem to be worth no more than $1.23.

find that they were in that year one hundred and thirty-one millions, the increase for the ten years being more than seventy per cent.

The exports of breadstuffs for the last fifteen years have singularly fluctuated, and, although their large increase from twenty-seven millions (27,701,121), in 1846, to sixty-eight millions (68,701,921), in 1847, and their fall again, in 1848, to thirty-seven millions (37,472,751) may be accounted for by the Irish famine of 1847, arising from the potato rot and short crops generally; it seems less easy to account for the differences in the exports of the last five years. They were in

1852, twenty-five millions	(25,857,027)
1853, thirty-two millions	(32,985,322)
Rising, in 1854, to sixty-five millions - - -	(65,941,323)
Sinking, in 1855, to thirty-eight millions - -	(38,895,348)
And rising, in 1857, to seventy-seven millions -	(77,187,301)

They must be owing, however, to fluctuations in the home supply, as well as in the foreign demand, affected as the latter has recently been by European and Eastern wars, and in the consequent suspension of trade with the Baltic, as the average export price of flour from the country, as ascertained by the Treasury Department for the years in question, throws little light upon it.

That price was as follows:

1852 - - -	$4.24
1853 - - -	5.60
1854 - - -	7.88
1855 - - -	10.10

A statement showing the actual average export price of flour at New York from the year 1800, has been published by the Department.

It is desirable that the causes of such fluctuations should be ascertained as nearly as possible, for, while unexplained, they are calculated to excite doubts in regard to the certainty of agricultural profits, and the element of uncertainty, wherever found, is calculated to discourage and to deter.*

Passing from the great staples of wheat and Indian corn to the other agricultural products of the country, a comparison of the Census of 1840 with that of 1850 gives us these general results,

And, first, as regards Stock:

The number of HORSES, asses and mules, had increased in number something more than half a million (560,381), the total in 1850 being about five millions (4,896,650). The number of horses had not increased as rapidly as other stock, in consequence of the extension of railroads lessening their demand for the purposes of travel; but, in the newly-settled States, where railroads were but commencing, the increase of horses had kept pace with the population. There is about one horse to every five persons in the United States. The 500,000 asses and mules returned are almost confined to the Southern States, where the climate is regarded as better adapted to this animal than the horse.

The NEAT CATTLE had increased nearly three and a half millions, and numbered over eighteen millions (18,378,907), of which six millions (6,385,094) were milch cows, about two millions (1,700,744) working oxen, and ten millions (10,293,069) other cattle.

The rate of increase of neat cattle for the ten years, was about twenty per cent. The amount of butter produced in 1850, was three hundred and thirteen millions of pounds (313,266,962), and of cheese, one hundred and five millions of pounds (105,535,129). The average value of the exports of these two articles, from 1845 to 1850, was about one million and a half of dollars.

SWINE had increased four millions, numbering in 1850 over thirty millions (30,354,213).

SHEEP had increased two and a half millions, and numbered nearly twenty-two millions (21,723,220).

In New England there was a remarkable decrease in their number, from 3,811,307, in 1840, to 2,164,452, in 1850, a decrease of forty-five per cent. In the five Atlantic or Middle States, New York, New Jersey, Pennsylvania, Delaware, and Maryland, taken together, there was a decrease of twenty-two per cent. The augmentation has chiefly been in the States south of Maryland, and west of New York.

The returns of Wool were as follows:

1840 -	35,802,114 pounds -		$11,345,318
1850 -	52,516,959	" -	15,755,088
1855 -	61,560,379	" -	23,392,944

* See a paper by J. J. Dawson, Esq., on current price and cost of corn in England, during the last ten years, as illustrating the value of Agricultural Statistics.—*London Statistical Journal, for March* 1855.

an increase of about forty-six per cent. The average weight of the fleece yielded by each sheep was, in 1840, 1.84 pound, and in 1850, 2.43, indicating a great improvement in the breed. This improvement is chiefly shown in the returns relative to Vermont, Massachusetts, and New York.*

The total value of live stock in the United States in 1855, was about five hundred and fifty millions (544,189,516,), and the value of animals slaughtered, about one hundred and twelve millions ($111,703,142).

The grain, root and other crops, from 1840 *to* 1850:

Rye had *decreased* from eighteen millions (18,645,567) of bushels to fourteen millions (14,188,813).

Oats had increased from one hundred and twenty-three millions (123,071,341) to one hundred and forty-six millions (146,-584,179).

Potatoes (Irish and sweet) had decreased from one hundred and eight millions of bushels (108,298,060) to one hundred and four millions (104,066,044).

Hay had increased from ten millions of tons (10,248,108) to thirteen millions (13,-838,642).

Hops from one million (1,238,502) of pounds to three millions (3,497,029) in 1850, and, as estimated by the Secretary of the Treasury, to nearly five millions (4,820,-752) in 1855, indicating a rapid increase in the consumption of Lager-beer.

Cotton had increased from eight hundred millions of pounds (799,479,275) in 1840 to nine hundred and eighty millions (978,317,200) in 1850, and to one billion and eighty-eight millions (1,089,409,908) in 1855.

Rice from eighty millions of pounds (80,-841,422) to two hundred and fifteen millions (215,313,497), while

Tobacco has *decreased* from two hundred and nineteen millions of pounds (219,-163,319) to one hundred and ninety-nine millions (199,752, 655).

Wool had increased from thirty-five millions of pounds (35,802,114) to fifty-two millions (52,516,959).

Silk Cocoons had *decreased* from sixty-one thousand pounds (61,652) to ten thousand (10,843).

Wine had increased from one hundred and twenty-four thousand gallons (124,734) to two hundred and twenty-one thousand (221,249).

From a table of the actual crops per acre in the different States,* it would seem that there is a diversity so great as to confirm the doubts in regard to its correctness frankly intimated by the compiler, who states that nothing better can be framed from the returns, which, in general, were very carelessly made, or entirely neglected.

In Wheat we find the average number of bushels to the acre to be 5 in Alabama and Georgia, 7 in North Carolina, Virginia and Tennessee, ranging upwards in the other States until it reaches 12 in New York, Ohio and Indiana, 13 in Maryland and Vermont, 14 in Iowa and Wisconsin, 15 in Florida, Pennsylvania and Texas, and 16, the highest average, in Massachusetts, being three times the average of the lowest.

In Rye we find the average of bushels to the acre to be 5 in Virginia, 7 in Georgia and Tennessee, 8 in New Jersey, 17 in New York, and 25 in Ohio, or five times the lowest average.

In Indian Corn we find the lowest average to be 11 bushels to the acre in South Carolina, 15 in Alabama, 16 in Georgia and Louisiana, 17 in North Carolina, 18 in Mississippi and Virginia, and so rising upwards until it reaches 27 in New York and Maine. 32 in Vermont and Iowa, 33 in Indiana, Illinois and New Jersey, 34 in Missouri, 26 in Ohio, and 40 in Connecticut, some three and a half times the lowest average.

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* The consumption of foreign wool in the United States, it may be remarked, appears within the last five years to be diminishing slightly in quantity. although not in value; but the importation of woolen manufactures is increasing. The importation of foreign wool was,

in 1840....9.813.312 pounds....$819.830
" 1850...18.669.794 " 1.681.690
" 1855...17.805.511 " 1.940.000

The importation of woolen manufactures was,

in 1840........................$9.970.868
" 1850........................18.614.589
" 1855........................23.603.223

The total consumption of foreign wool in England, in 1855, was 66 millions of pounds. Total production of woolens, $180.000.000, and exports of woolens, $48.000.000.

The total consumption of foreign wool in France, in 1855, was 77.300.000 pounds. Total production of woolens $200.000.000, and exports of woolens $38.000.000. The total production of woolens in the United States, in 1854 and 5, was $48.000.000.

* Given in the Compendium of the Census, page 178.

In Oats we find the lowest average, 10 bushels to the acre in North Carolina, 12 in Mississippi and South Carolina and Alabama, 13 in Virginia, 18 in Arkansas. Georgia and Kentucky, 20 in Delaware, Indiana and Maine, 21 in Connecticut, Maryland and Ohio, 22 in Pennsylvania, 25 in New York, 26 in Vermont, New Jersey, Missouri, Michigan, and Massachusetts, 29 in Illinois, 35 in Wisconsin, and 36 in Iowa.

Of Rice we have returns only from three States, Louisiana giving 1,400 pounds to the acre, South Carolina 1,750, and Florida 1,850 pounds.

Sweet Potatoes vary in quantity from 65 bushels to the acre in Texas to 175 in Louisiana, 200 in Alabama, and 400 in Georgia.

Irish Potatoes yield from 65 bushels to the acre in North Carolina, 75 in Maryland, New Jersey, Ohio and Pennsylvania, 100 in Indiana, Iowa, New York and Rhode Island, 120 in Maine and Tennessee, 100 in Georgia and Wisconsin, 130 in Kentucky, 140 in Michigan, 170 in Massachusetts, 175 in Florida, 178 in Vermont, to 230 in New Hampshire, and 250 in Texas.

In this table particularly it is difficult to account, except on the supposition of error, for so large a difference in the average yield per acre between States so alike in character, as Alabama (60) and Georgia (125), or between Connecticut (85), Vermont (178) and New Hampshire, (230).

No question, perhaps, connected with American Agriculture is of more general interest and importance than the measure of profit which may reasonably be expected from capital invested in farms, and managed with that degree of skill and industry, which are the recognized requisites to success, in the various branches of commerce and manufactures, in the trades, and learned professions.

It has been truly remarked, that "mankind have a habit of graduating the rank of labor by the recompense it receives; and it is undoubtedly the conviction that agricultural labor is less profitable than many other employments pursued in cities and large towns, that induces so many thousands of our ambitious and energetic youths, especially in New England and the Atlantic States, to forsake their rural homes, and the half-cultivated farms of their fathers, in the hope of more rapidly achieving independence, and perhaps fortune, in communities where every branch of trade is already overcrowded with anxious competitors.

The same idea is not unfrequently entertained by capitalists. The common belief seems to be, and it is, doubtless, founded upon common experience, that the profits of farming operations are very moderate, and that it is idle to expect more than a small per centage from capital thus invested. A contrary belief is usually attributed to an undue enthusiasm with no basis of fact, and occasional instances of large profits are regarded as extraordinary exceptions, that are to be attributed to local and special causes, and are not, therefore, to be allowed any weight in the support of a general theory.

It is most desirable that accurate statistics in regard to the fair profits of capital invested in agriculture, after just allowance for the industry required for its development, should be gathered from all sections of the country, and it would be well if some inquiries to this end were embodied in the Agricultural schedules for the approching Census.

The fact is as yet but imperfectly appreciated among us, that Agriculture, which, in its origin was but an art, has been gradually raised to the dignity of a science; and now thanks to the discoveries of the great practical and analytical chemists in Europe and America, of whom Liebig is the chief, stimulated and aided by the mechanical invention, for which our age and country are so remarkable, it occupies a position of pre-eminence unknown during the last century.

"There is, I believe," says Mr. Everett, "no exaggeration in stating that as great an amount and variety of scientific, physical and mechanical knowledge, is required for the most successful conduct of the various operations of husbandry, as for any of the arts, trades or professions."

Assuming this position to be correct, it is clear that no amount of evidence in regard to the profits of farms conducted by men wanting in this wide range of scientific, physical and mechanical knowledge, can determine the profits that may be reasonably expected from farms of the like capability, where that varied knowledge institutes and guides every operation.

But there is reason to believe, that while the limit of Agricultural profits generally throughout the country is as much below the line it is capable of reaching, as the present standard of Agricultural education is below that high standard to which Mr. Everett directs the ambition of the American farmer, there are good grounds for the opinion, that with the increase of an Agricultural literature, the diffusion of books and newspapers, of farmers' clubs, of State, county, and town, Agricultural Societies, of national and local fairs and exhibitions, there is a perceptible and repaid improvement in the rural economy of the country, in the intelligent culture of the soil, and in the profits of Agricultural capital.

So long ago as 1795, Mr. Burke placed the proper profits of a proprietor of 1,200 acres at 12 per cent. Sir John Sinclair a quarter of a century later, declared the proper profits at 10 to 15 per cent. Mr. Rives, of Virginia, by whom these facts were mentioned in a very interesting Agricultural address, stated the profit of the model farm at Gignon, near Versailles, at 14 per cent. The "*Revue des deux Mondes*" for February 15th, 1858, in an article entitled, "Les Questions Agricoles en 1848," mentions that the net profits of the farm at Bresles, in the department of the Oise, rose in 1856, to 246,000 francs upon a capital of 800,000 being more than 30 per cent.

Occasional accounts in our Agricultural papers indicate a rate of interest, which if verified as one that could be reasonably anticipated with a due share of skill and industry, would immediately induce the investment of millions of capital in Agricultural operations, to the benefit of the country at large, as well as to the individuals making the advances.

One point that should not be lost sight of in a consideration of the advantages attendant upon agricultural operations is the safety of the capital invested, compared with the chances of loss attendant upon commercial or manufacturing investments. The Hon. Emory Washburne, of Massachusetts, in an address before the Worcester Agricultural Society, in 1854, stated some facts bearing upon the question, which a statistical inquiry, if one could be accurately made, into the successes or reverses of the various pursuits in which our countrymen engage, might probably multiply to an extent, that, without proof, would hardly be credited. Of the merchants in Boston doing business at a certain wharf during forty years, only six became independent, the remainder failed or died destitute of property. Of one thousand merchants, having accounts at a principal Boston bank during the same year, only six had become independent.

Another investigation led to the startling result, that of every hundred traders, but seven succeed in acquiring wealth. From such reverses the farmer is comparatively free. Of eleven hundred and twelve bankrupts who took the benefit of the bankrupt law in Massachusetts only fourteen were farmers; and of twenty-five hundred and fifty bankrupts in New York, only forty-six were farmers. Less than two per cent. of the bankrupts belonged to the Agricultural population, although that population so largely exceeds all the rest of the people however classified.

At the present moment, when the leading manufacturing interests of the country are in a languishing condition from their recent reverses, and the conviction is generally felt, of the precariousness of their profits for the future, dependent as those profits are upon the varying policy of opposing parties; the claims of Agriculture upon the attention of capitalists, as well as statesmen, are likely to be more fairly scrutinized than when commerce and manufactures were in the full tide of success. Should the schedule for the approaching Census include the question of Agricultural profit in such a form that the returns may afford reliable data for prudent calculation, the next decade may perhaps see an investment of capital from the Atlantic States, in the cultivation of wheat and corn in our western valleys, to an extent that shall materially swell our exports of breadstuffs, and constitute them the chief element in our foreign exchanges

Much has been said of late years of a gradual deterioration of the soil in the older States, as evidenced in part by the decreasing ratio of crops to the acre, as compared with the ratio in former years and with the usual ratio in other countries.

Mr. Morrill, M. C., of Vermont, by whom a bill has been introduced into the House of Representatives designed to grant to the several States some ten millions of acres to be divided amongst them in proportion to the number of senators and representatives they send to Washington, with the view of promoting Agricultural education and Agricultural science, by the establishment of an Agricultural college in each State, has made some startling statements upon this subject.

He affirms that Agriculture is rapidly declining in every State of the Union, that the quantity of food produced bears each year a smaller proportion to the number of acres under cultivation, and that over a very wide area some of the most useful crops bid fair to become extinct.

A writer in the "Year Book of Agriculture for 1855," on the "Alarming Deterioration of the soil," referred to various statistics of great significance in connection with this subject. Some of them regarded Massachusetts, where the hay crop declined 12 per cent. from 1840 to 1850, notwithstanding the addition of 90,000 acres to its mowing lands, and the grain crop absolutely depreciated 6,000 bushels, although the tillage lands had been increased by the addition of 60,000 acres.

In Indiana the river bottoms which used to produce an average crop of sixty bushels of corn to the acre, now produce but forty. In Wisconsin, which is younger still, it is estimated that only one-half the bushels of wheat are now raised to the acre that were raised twleve years ago; and the writer declares as the conclusion of the whole matter, "that the soils of New England, after all the admonitions we have received, are annually growing poorer, and that *even the lands of the great West* are rapidly becoming exhausted of their fertility."

He refers to the large falling off of the wheat and potato crops in New England, which have however been replaced by Indian corn, and also to the falling off of wheat in Tennessee, Kentucky, Georgia and Alabama, to the extent of 60 per cent. from 1840 to 1850, and assumes that the Agricultural statistics of each State tell the same sad story.*

As regards falling off in the production of the country, I think it is clear from a comparison, not of wheat and potatoes alone, but of the total products of the soil, espcially of Indian corn, in 1840, with that of the same crops in 1850, that Mr. Morrell is mistaken; but as productiveness of crops and distructiveness of soil are saidto be the two most prominent features of American Agriculture, the large harvests in our young States ought not to blind us to the fact that the fertility of those parts of the older States which once yielded as abundantly, seems to have been steadily diminishing for a course of years.

This fact is exhibited, not only in the wheat lands of New England and other parts of the North, but on the tobacco fields of Virginia, and the cotton plantations of the South;* and the subject undoubtedly deserves the most careful investigation.†

The deterioration of our soil is doubtless owing, in a great part, to a careless system of cultivation, common to new countries where land is cheap and labor is dear, and the soil is naturally productive, and the individual cultivator is intent upon large immediate returns, thoughtless of the permanent fertility of his farm, careless of the interests of his successors, and regardless of the prosperity of the community at large. It has been suggested that every agricultural people runs the same race of exhausting culture, shallow plowing, a continuous course of impoverishing, with neither rest, rotation nor sufficient manure; and that necessity alone can convince them that duty and interest both demand, that land shall be so tilled as to increase rather than diminish in fruitfulness. Such a necessity in the lessening crops of the Atlantic States, and westward emigration in search of more fertile territories, already presents itself to the intelligent American agriculturist: and the reasonable belief that the same exhaustive system will soon begin to tell upon the most productive regions of the West, has led to the discussion in agricultural newspapers, and at farmers' clubs, of the philosophical causes of the exhaustion, and the best means of renovation.

In some sections of the country efforts to restore exhausted lands have been attended

* I gather this account of Mr. Morrell's statements from an editorial in the N. Y. Evening Post.

* Progress of Agriculture in the United States, by Daniel Lee, M. D., Patent Office Reports for 1853, p. 2. and "Southern Agricultural Exhaustion and its Remedy," by Edmund Ruffin, Esq., of Virginia: read before the South Carolina Institute at Charleston, same volume, page 373.

† Prof. Liebig mentions the fact, that the value of tobacco depends upon the quantity of potash contained in the ashes; and that accurate analyses of the various sorts of tobacco have been executed by the Administration at Paris, as furnishing a mode of distinguishing the different soils on which tobacco was raised, as well as the peculiar class to which it belonged. The Professor then says: "Another striking fact was disclosed through these analyses. *Certain celebrated kinds of American tobacco were found gradually to yield a smaller quantity of ashes, and their value diminished in proportion.*"

with the most marked pecuniary success. Mr. Ruffin, of Virginia, estimates the increased value of reclaimed lands in Eastern Virginia, by marling and liming, from 1838 to 1850, at some thirty millions of dollars. In the well known case of a similar success from claying a light soil by the celebrated Coke of Norfolk, afterwards Earl Leicester, that gentleman doubled the value of his estates in Norfolkshire: and among numerous instances of immense improvement simply from drainage and deep plowing, with but little aid from fertilizers, may be mentioned one cited by Prof. Johnston of the Home farm at Yestces, belonging to the Marquis of Tweedale, where the land, by these means, was raised in value eight times—from 5 shillings to 40 shillings rent per acre.

There are no reliable data from which we can now gather the progress of deterioration in productive lands in the United States, or the reclamation of exhausted lands; but the rapid increase in the use of *guano*, the most powerful of restoratives, indicates to some extent the increasing attention paid to fertilizing.

The consumption of *guano* for 1855, as stated by Prof. Mapes, was about 140,000 tons. The amount sold in England, during the year 1855, was stated by Mr. Nesbitt at 210,000 tons being an increase of twenty per cent. on the consumption of 1854, which was also an increase of twenty per cent. over that of 1853; this increase has taken place in the face of a rise in the price, from forty-five to about eighty dollars per ton.

It would seem proper that the schedules for the new Census, should embrace inquiries in regard to the deterioration or improvement of the soil, which may be shown, not only by the ratio of crops to the acre at successive periods, but by the market value of the same lands at the stated intervals; and that the schedules should also exhibit generally the quantity and prices of the various fertilizers in use—barn-yard manure firstly and chiefly, then guano, poudrette, lime, gypsum, marl, muck, and so forth, that are yearly devoted to the enrichment of our soils. Upon this item of manure insignificant as it might seem to the unreflecting mind, depends the continuous prosperity of our country. This is the secret of England's Agricultural wealth. Mr. Webster, in his sketch of English Agriculture, quoted the extraordinary fact stated by M'Queen, "that the value of the animal manure annually applied to the crops in England, at current prices, surpasses in value the whole amount of its foreign commerce," and he added, 'there is no doubt that it greatly exceeds it.'*

The schedules might also advantageously give us, not simply the amount of new lands brought into cultivation, but of the worthless lands that have been reclaimed by drainage.

In almost all the States extensive tracts of swamp lands are found, not only unfit for cultivation, but frequently inducive of that fearful scourge of health and happiness, fever and ague, that year after year prostrates the energies, and shortens the lives of tens of thousands of our countrymen.

Large grants of these swamp lands have been gratuitously made by the Federal Government to the States, in the hope of their reclamation through measures to be adopted by the State Governments. Since 1849 nearly sixty millions of acres have been thus granted.† In the drainage of large tracts of land we have the benefit of the experience of Europe, especially Holland, where the Harlem Lake, thirty-three miles in circumference, and thirteen feet deep below the tide, has, since 1839, been converted into a most fertile tract, occupied by some two thousand inhabitants, and exhibiting fields of verdure, dotted with numerous cottages, and enlivened by cattle, horses and sheep, grazing on the fruitful meadows. The lands thus reclaimed from the ocean are of extraordinary fertility, and are estimated as capable of supporting seventy thousand persons.

Of the pecuniary results of drainage in this country Gov. Wright, of Indiana, quoted an example in a public address touching the marshy lands of that State embracing three thousand acres. He mentioned a farm of 160 acres which had been sold at five hundred dollars, and after an expenditure of two hundred dollars in drainage, was worth upwards of three thousand dollars, or an advance of more than 500 per cent.

But, apart from these large tracts of overflowed lands, scarcely a farm in the country but would be improved by thorough drainage, and it would not be difficult to ascertain the number of acres under-drained in each year of the Census, nor the estimated

* Webster's Works, Vol. I., p. 448.

† See an interesting paper on drainage by Henry F. French, of Exeter, New Hampshire, in the Patent Office Reports for 1856, page 160.

additional value which they thereby received.*

Looking at the acreage now devoted to Indian corn, to say nothing of our other crops, it has been estimated that by the adoption of an improved system of Agriculture, embracing drainage, deep ploughing and skilful manuring, the entire crop now yielding 400 millions of dollars, might, upon the same breadth of land, be trebled if not quadrupled. At present, with occasional exceptions, our average crops per acre are even less in our most fertile and almost virgin States than in the soil of Europe, that has been cultivated for centuries.

Take Wheat, for instance. The average crop per acre in New York, Ohio and Indiana, is 12 bushels; in France it is 13; in England, 21;† in Flanders, 23; in Scotland, 30 (on the authority of Professor Johnston); and in New Brunswick, 19.

How the average might be increased throughout this country by careful culture, we may, in part, learn from the returns of occasional crops in England of seventy bushels, in New York of sixty, on the prairies of forty-four, and at San Jose, as is reported, of eighty-seven.

Yet another topic closely connected with the interests of American Agriculture is the recent diminution of the proportion of the male population engaged in Agricultural pursuits, as compared with the number engaged in commercial and other pursuits. The precise ratio of that diminution cannot be ascertained from the Census, for the reason that the tables of 1850, on the leading occupations of the people, were based upon the whole number of male inhabitants over fifteen years of age, including all the free males, and three-fifths of the male slaves; whereas the former tables of occupation, made in 1840 and 1830, were based upon the entire population. The Census of 1840 made the portion engaged in Agriculture 77.4 per cent. for both sexes, that of 1840 only 44.69.

There is, therefore, reason for believing that the proportion of the population devoted to Agricultural pursuits is decreasing: and it is important that the schedules of the next Census should be drawn with reference to the determination of this point with entire accuracy, and should develop whatever facts may be essential, to enable us to discover, and if possible to correct, the causes that may be diverting an undue proportion of American industry from the culture of the soil.

The attractiveness of town and city life for the labouring classes may be lessened by a study of the tables of mortality, showing that the average duration of life is much larger in the rural districts.

In England the average duration of life is forty-five years in Surrey, but only twenty-five in Manchester and Liverpool.*

A paper, by Mr. Edward Jarvis, on vital statistics at Dorchester, in Massachusetts, red before the British Association in January, 1840, showed that, out of 1,700 persons,

The average life of	Farmers was	45	years
"	Merchants	33	"
"	Mechanics	29	"
"	Labourers	27	"

Looking from the average years of life to the increase of the male population, we find it stated that in Massachusetts, among the cities and towns it is six per cent., while among the Agricultural population it is 8 per cent., a difference of male births in favour of the rural districts of 33 1-3 per cent.

These facts, if verified by the national statistics, and brought home to the consciousness of the people, are certainly calculated to restrain a preference for the crowded streets and impure atmosphere of our cities, over the broad fields and bracing air of the country; and the feverish anxiety for rapid gains in mercantile pursuits, may be advantageously checked by statistics showing the uncertain gains of commercial speculations, and the certain profit of enlightened Agricultural toil.

The leading facts at which we have glanced, of an increasing foreign demand for breadstuffs, the limited breadth of our

* The committee on drainage, in their report to the State Agricultural Society of New York, in 1848, assert, that "there is not one farm out of every seventy-five in this State, but needs draining—much draining—to bring it into high cultivation. May we venture to say that every wheat-field would produce a larger and finer crop if properly drained."

† Prof. J. F. Johnston, 1849.

* John Yates', Esq., Paper on our National Strength, tested by the numbers, the age, and the industrial qualities of the people, read before the British Association at Glasgow, September, 1855.

arable land, which thousands of our citizens have been taught to regard as inexhaustible, the gradual deterioration of the soil from a wasteful system by which the constituents of fertility are removed with each successive crop, without being restored by appropriate manures—a system based upon the desire for immediate gains, without thought of the sacred duty that devolves upon us to transmit the soil to our posterity, with undiminished productiveness, that it may sustain in comfort and happiness the unnumbered millions that are presently to occupy our land; these and similar consideratians connected with the present and future prosperity of our country, appealing at once to the interest and the patriotism of the nation, may be so elaborated and diversified, and verified by the tables of the Census, that its returns shall teach us not simply lessons in political economy but lessons of daily duty, the benefits of which shall be reaped alike by the present and future generations.

There are various topics connected with American Agriculture on which I would like to touch, did time permit me. One, the recent and rapid introduction of improved agricultural machinery soon probably to be followed by the use of steam plows and other machinery worked by the same motor, overcoming, to a great extent, the chief difficulty of the American farmer in the high price of labour; that feature of our agriculture which constitutes so marked and essential a difference between the practical agriculture of America and Europe.

Another is the spread of agricultural science, through the efforts of the patent office distributing their reports and seeds gathered from Europe; through the multiplication of books and papers devoted to the subject, and by county, state and national societies and farmers' clubs, in their frequent meetings, addresses, and exhibitions of agricultural implements and products.

What the country now most requires in reference to its agriculture, is, that its condition should be faithfully photographed in the returns to each Federal Census, and it will be for the Agricultural Section of this body to prepare well considered suggestions for the new schedule and submit them to the Federal Government. Such suggestions will appropriately come from the American Geographican and Statistical Society, in view of its national character and the scope of its labours; and such suggestions, judging from the past, the Federal Government, will cheerfully receive and carefully consider.

Among the additional items which might advantageously be included in the schedules, I would suggest the following:

As regards persons employed in farming.—The proportion of the population thus employed of both sexes. Their average life, as compared with that of persons living in towns, and of other trades.

As regards capital employed in agriculture.—Not only the proportion invested in land, stock and implements, but the profit thereon received during the year immediately preceding the Census.

As regards the farms.—Not only the improved and unimproved lands, and the proportion in meadow, pasture or tillage, but the number of acres of each farm that have been drained; the number requiring drainage; the number drained during the last year; the cost of draining, and the value of the land before and after.

In regard to the improvement or deterioration of the soil.—The average of each crop and cost of each per acre; the average of bushels or tons to the acre, and the cash value of each on the spot.

In regard to manures.—The amount, variety, and cost of those applied during the last year, and the rate of cost per acre.

Other suggestions will doubtless, be made, a collation of which, by the Bureau of the Census, may afford us in future years, the means of tracing the progress of American agriculture, and reading its actual condition at each decade, with the same facility with which a prudent merchant reads the past and present of his business in the carefully prepared balance sheet; and if the future of America shall continue to exhibit the same steadily progressive advance that we find in her past, the tabular results of each succeeding Census, dry and uninteresting as they may seem to those who shall see in them but columns of figures, will in fact develop the fulfilment of some of those prophesies of the coming wealth and splendour of the Western Continent, that when occasionally uttered by our far-seeing economists, are apt to be regarded as the careless dreams of visionary enthusiasts.

Mr. President and Gentlemen, I cannot close this address without remarking, that the increasing application of natural science to rural economy, will closely connect the Agricultural with the other Sections of your body, and that our Agriculture is the National interest which is to be chiefly benefitted by their learned researches.

The late Prof. Johnston, of Edinboro', whom I was so happy as to know during his visit to this country, and whose admirable lectures in the United States have connected his name with American as it was already identified with British Agriculture, on one occasion dwelt upon the aid which the art of culture receives from every branch of science, and this association is, I trust, destined to verify the correctness of his remarks.

The Section of TOPOGRAPHY,* embracing the physical geography of the Continent, and the topography of the several States and Territories in detail, concerns, among much else that is interesting, the extent and character of our arable soil, or mountain elevations and depressions; our table-lands and low plains, and in connection with the section on HYDROLOGY,† will exhibit the influence of the ocean and the gulf, of our lakes and rivers, of tides, gulf-streams, prevailing winds and storms on the capabilities of the country, and the practices and profits of its cultivators.

The Sections on GEOLOGY‡ and METEOROLOGY,‖ have an equally direct bearing upon Agriculture, in explaining the nature of the rocks and of the soil, the fall of rain, the necessity for irrigation and for drainage.

The Section on BOTANY,§ may materially aid the farmer, by teaching him the nature of the weeds that check his progress; of the rust, smut, and mildew which attack his cereals; of the cause yet to be discovered, of the rot in the potato; of the mutual adaptation of plants to the soil; of their special habits and natural structure, their increase and decrease in various localities.

The Section on ZOOLOGY and ANIMAL PHYSIOLOGY, embraces by your classification; domestic animals and their commercial value, their various breeds, the rearing of stock, and it perhaps properly includes the agency of animal life in fertilizing the soil. That on COMMERCE relates to the transport and exports of breadstuffs, and their relation to our foreign exchanges; that on MANUFACTURES to our Agricultural implements, enlarging our production by diminishing the necessity for human labour; and that on FINANCE, to our national wealth, of which Agriculture is the most prominent feature.

We began, gentlemen, by recognizing in Agriculture the largest material interest of our country, constituting the bulk of her wealth, and indicating, in no small degree, the physical comfort, the prosperity, and the civilization of our people.

We next consider its relation to less favoured foreign lands, whose children look to us for food:—a relation that invests the quiet labours of our farmers with an interest beyond the seas, not simply in shaping commercial speculation, and regulating among merchants the price of bread, but in gladdening distant homes, in staying the march of famine and starvation, in allaying popular discontent, and even averting national revolutions.

After a survey at the area, the population, the products, and the statistics of our great American farm, of its home resources, its foreign markets, and its probable future, we close with the thought, that for the advancement of this great interest, which supplies millions with healthful and profitable employment, and other millions with their daily bread; canals and railroads intersect our continent, extending westward towards the far Pacific; ships whiten the ocean, and steam labours in a thousand forms. That to supply its workmen with fitting implements, inventive genius is ever wakeful, and mechanical skill unceasingly active. That in their behalf chemistry, by the crucible and analysis, is extorting from nature her hidden secrets; and science, in all her forms, is leading her skillful aid to perfect, in this advanced and advancing age, the art that was born with the creation, in the garden that was given to man to dress and to keep it.

We close with the thought, suggestive of thankfulness and good will, that all these agencies are at work for the benefit of our universal brotherhood, to lighten

* Mr. H. V. Poor, Chairman.

† Rev. Dr. Hawks, Chairman.

‡ Lieut. E. L. Viele, Chairman.

‖ Henry E. Pierrepont, Esq., Chairman.

§ Rev. Joseph P. Thompson, Chairman.

the primeval curse, and to compel from our common mother, for the benefit of the children of a common Father, more varied and abundant harvests, with greater certainty and with lessened toil.

Let us also reverently remember, gentlemen, in our study of the laws of Political Economy by the guiding light of statistics, that the truths which we seek to discover, are a part of that universal law whose seat is the bosom of God, and whose voice the harmony of the world.

Nor let us ever forget, in the contemplation of our unparalleled blessings, that the happiness and prosperity of a nation depends infinitely less on their material wealth, than upon the observance of those great rights and duties which our fathers solemnly recognized when we took our place in the family of nations.

From the Working Farmer.

Increase in the Cost of Food.

It may be considered as one of the most serious questions in the political economy of the United States that, notwithstanding the infancy of the nation compared with the venerable empires of the old continent, and the newness and natural fertility of its soil, the price of human food, particularly that of animal products, has been gradually increasing for a long series of years. In other words, the miner of gold, silver, copper, iron, lead or coal, or the worker in any natural products, must give a larger quantity of them now for his necessary supply of meat, than he ever gave before, taking the average of any decade of years since America began to be a civilized nation.

With the exception of occasional spasmodic advances, or depressions below the line, the upward tendency of the price of food-producing animals in the United States is just as regular and certain as the inclined plane of any railway from the sea-board to the interior. * * * * *

Now, that the present prices are not spasmodic, nor attributable to the ordinary fluctuations of trade, nor to the short crops of any year, nor to the increased foreign demand, nor to the diversion of trade in cattle in any unusual direction, nor to an unusual short supply for this year, nor to an increase of circulating medium, we think we shall be able to show. According to the opinion of good judges and men of long experience, the general average price of beeves, sheep and swine, in November and December, has never ranged so high throughout the country as it has this year. The general quality has never ranged higher in this city, while the number weekly reported will prove a most abundant supply. What is the cause of the continued and gradual advancement of the price of food, producing animals in the United States? and is it likely to be permanent? or will the day come when we shall return to the "good old time" of cheap roast beef, and when the ordinary fluctuations in trade shall establish corresponding prices with those we have stated? These are important questions; and we know that many persons consider the present prices of meats exorbitant and unreasonable, simply because they are so much higher than they have been accustomed to, without even thinking they are so only as the work of "speculators," and so only as that work ceases the price will run down the scale to the old standard.

In that they will be disappointed. Meats in the United States will never again be sold, as a general thing, at the prices we have noticed in this article; and the reason which we shall give is one that no merchant or political economist will dispute, because it is based upon that fundamental rule—the existing relation of demand and supply. The demand in any market town in the country cannot remain a single month in such relation to the supply as materially to increase the price, without bringing from the remotest districts such a supply—and it is astonishing how rapidly the animals slide down the inclined plane from the mountains and plains of the interior—that the price becomes equalized, less the cost of transit, all over the country. "Then why don't we get our beef, and pork, and mutton cheaper?" is the question naturally arising in every mind which does not trace effect to its *cause.*

The law of demand and supply is not an arbitrary one; and the supply of beef-cattle, mutton-sheep, and fatted swine, is beyond the reach and control of any speculator or company of speculators; and certainly none exist which has produced the present prices.

Why, then, has the price for a series of years continued in one general, regular progression up the scale? It can only be accounted for by the fact that there has been a regular diminution in the supply, until the natural law has increased the price; and the next question of any importance is, whether that diminution is permanent, and if so, why?

We do not mean to be understood that there is a real diminution of food-producing animals, but only a relative one to the consumers. The case is just this: A man and his wife, in commencing life, fatted and killed one hog every fall for their supply of winter meat, and the supply was sufficient for the demand. But in due course of time there was an increase of mouths, till the number to be filled was quadrupled, and then the one hog was insufficient for them all; and if they had not been contented to continue to make an equitable division of the flesh between all the mouths, it is probable that one would have outbid the other, and so enhanced the price in money to those who did not consume it. Now, is this the case with the people of the United States? Has the family become too large for the national pig-pen?

We lay it down as an axiom, that domestic animals decrease as human beings increase. China is a witness of this fact; and so is our own country, though it has not generally been supposed that this relative diminution had taken place in the United States to a degree sufficient to permanently affect the supply and price of the three great feed-producing class of animals. Facts derived from figures, which, it is said, though somewhat figuratively, cannot lie, prove that the diminution has commenced; and the increase of prices further prove that the supply is insufficient for the demand; so that the high prices are a legitimate result; and that they will not recede permanently, becomes a moral certainty. The increase of population relative to the increase of animals, particularly the non-producing class of persons, such as reside in cities, or are engaged in other employments than farming, is much greater than we would believe possible, but for the proof of the figures found in the census returns. Again, another reason of short supply for home consumption, is the increased exportation of all animal products, and that is more likely to grow larger than it is to decrease.

We have been for years endeavouring to encourage farmers to increase the supply of meat in this great emporium, constantly assuring them that good beef cattle would always sell at prices equivalent to the ten cents a pound for the meat, and that they could better afford to make beef at that than to grow grain at the general average price. We were asked last spring, by one farmer, if we really believed that beef cattle would be worth this price the present fall; and assured us if he could think so, that he would buy and feed a hundred bullocks; but his opinion was that the Great West was so full of cattle, that prices must come down. On the contrary, with much less packing, the price has advanced beyond the anticipations of the most shrewd men engaged in the business of feeding, and buying and selling beef cattle. It is highly important for producers and consumers and dealers to inquire for the cause, and see if they can think, as we do, that the present rates will continue so, as to base their operations upon the new truths they may discover. In proof of our proposition, we offer the following tables, which we find ready prepared to our use in the *Cincinnati Gazette*, in an article taking the same view we do, that the general production of the country is insufficient for the consumption the people have accustomed themselves to during a long period of low prices—that is comparatively low with the present, as the present here are with prices in the older countries of Europe.

The first table shows the United States census at two decades, of animals, and the per cent. increase of each, and comparative per cent. increase of population.

NUMBER AND INCREASE OF CATTLE IN THE UNITED STATES.

Animals.	1840.	1850.	Ratio of in.
Horses and Mules,	4,385,399	4,896,050	13 pr ct.
Neat Cattle,	14,971,586	18,378,907	24 pr ct.
Swine,	26,201,293	30,854,213	16 pr ct.
Sheep,	19,111,374	21,723,290	13 pr ct.
Increase of population,			35 pr ct.

It will strike every one with force that population has increased so much faster than cattle. The bullocks have increased only two-thirds as fast as the people, and the swine only half as fast, in all the country, while in twelve of the oldest States the following table shows just what we have alleged, that an increase of population, and more extensive subjugation of wild lands to domestic purposes has a tendency to decrease the number of domestic animals, and produce the necessity for the people to cease, in some measure, their meat-eating habits, and adopt a diet of roots, cereals, legumens, and culinary vegetables. Even butter and cheese must be given up, in a great measure, or continue to grow more and more expensive to the consumer, as the great pasturage of these old States are converted into grain fields or gardens to produce vegetables for the use of the cities and the constantly increasing, densely populated rural and manufacturing districts, or to furnish the immense demand for milk, which the growing cities create, and which the railways have extended in a radius of a hundred miles inland, so that farmers cannot afford to manufacture their milk which was formerly otherwise worthless, into butter and cheese, at the old, or even the present prices. This milk business also has another important effect upon the production of animal food, because it induces an almost entire destruction of calves throughout all the region devoted to the production of milk for city use. A great portion of these calves, too, are destroyed while so young that they are absolutely unfit for human food, though largely consumed by a low grade of the foreign population of cities; but the amount of sustenance in a calf only two or three days old is of course very small, as the weight is light and the meat innutritious. This destruction of the very seed of cows as well as beeves, in the very extensive regions furnishing milk to the inhabitants of towns and cities, necessitates a continual and annually increasing draft upon the newer lands of the Northwest.

Let us first look at the actual decrease of animals in New England, New York, New Jersey, Delaware, Maryland, and Virginia.

DOMESTIC ANIMALS IN THE OLD STATES.

	1840.	1850.	Decrease.
Horses and Mules,	1,612,883	1,529,189	83,694
Neat Cattle,	6,172,569	6,033,841	89,728
Swine,	6,897,396	4,909,334	1,988,012
Sheep,	11,872,622	5,450,678	6,221,950

This shows a very large decrease, but nothing to be compared with what will be shown at the next census; while the population in the whole of those States is increasing every day, and becoming more and more concentrated in cities, and consequently dependent upon the immediately surrounding county for milk and vegetables, and upon the Great West for a supply of butter, cheese, and meat, and all other animal products.

As the west is populating with almost fabulous rapidity, and towns, and cities, and manufacturing villages are growing there as well as here; and as a large number of persons are, and will continue to be, engaged in railway building, mining, and other non-agricultural employments, it is a matter of interest to cattle-raisers and consumers to know whether this increase of population carries with it such a corresponding increase of food-producing animals as will enable the West to continue to supply the great demand of the East, even at the present prices. This may be guessed at by the guessing population of the Eastern States, and "reckoned" over by the producers of the West. The table embraces Ohio, Indiana, Illinois, Kentucky, Tennessee, and Missouri:

DOMESTIC ANIMALS IN THE NEW STATES.

	1840.	1850.	Increase.
Horses and Mules,	1,804,092	2,116,160	312,068
Neat Cattle,	4,307,952	5,280,433	972,481
Swine,	11,726,209	13,843,041	2,116,832
Sheep,	5,197,906	8,435,658	3,237,752

Now, to make up the decrease of animals in the old States, these new ones ought to show an increase very considerably in excess of the increase of population; instead of which, the population appears to have increased 35 per cent, while the increase in these two great food-producing classes, the bovine race and swine, does not exceed 20 per cent.

Now, if we look at one more table, which shows the exports of animal products, and how they have gradually increased during the last twenty years, we think that no one can fail to see the cause of an increased price of meats.

Exports of animal products and breadstuffs:

Period of		Amount.
1836--'40 inclusive,	- -	$ 6[illegible],050,000
1842--'46	" - - -	110,521,000
1847--'51	" - - -	194,330,000
1852--'56	" - - -	233,679,000

The exports have trebled in this period, while the production of meat has decreased, and thus the demand has exceeded the supply, while, from long acquired habits of consuming large quantities of meat, butter, and cheese, our population are unwilling to forego their use for vegetable food, notwithstanding the increase of price; and consequently, there has been a very large increase in the price of all food-producing animals; and that increase will be permanent; and hence the producers are perfectly safe in basing their calculations upon this fact, and in enlarging their operations.

Nothing but a rise of prices of animal food to a point that will induce a decrease of consumption can now effect the present condition of the cattle-market of the country. The prices of butcher's meats in New York are still so far below those of London that exportation would take place if the meats could be transported in their fresh state; but the difference in price does allow shipments of salted provisions, and that will, as it already has done, continue to affect the price of cattle to the remotest farm of the great North-western region of the Mississippi Valley; and, while it enhances the profits of the producing class, will continue to raise the price to all the non-producers who rush into the vortex of cities, or in any way cease to raise the food they consume.

If our facts shall have a tendency to assure producers that the demand will not abate, and therefore induce them to increase the supply, we shall be content, for that is the object of this article.

The Coffee and Sugar Plantations of Cuba.

BY RICHARD H. DANA, JR.

[From "A Vacation Voyage to Cuba and Back."]

The change from coffee plantations to sugar plantations—from the cafetal to the ingenio, has seriously affected the social, as it has the economic condition of Cuba.

Coffee must grow under shade. Consequently the coffee estate was, in the first place, a plantation of trees, and by the hundred acres. Economy and taste led the planters, who were chiefly the French refugees from St. Domingo, to select fruit-trees, and trees valuable for their wood, as well as pleasing for their beauty and shade. Under these plantations of trees, grew the coffee plant, an evergreen, and almost an ever-flowing plant, with berries of changing hues, and, twice a year, brought its fruit to maturity. That the coffee might be tended and gathered, avenues wide enough for wagons must be carried through the plantations at frequent intervals. The plantation was, therefore, laid out like a garden, with avenues and foot-paths, all under the shade of the finest trees, and the spaces between the avenues were groves of fruit-trees and shade-trees, under which grew, trimmed down to the height of five or six feet, the coffee plant. The labor of the plantation was in tending, picking, drying, and shelling the coffee, and gathering the fresh fruits of trees for use and for the market, and for preserves and sweet meats, and in raising vegetables and poultry, and in rearing sheep and horned cattle and horses. It was a beautiful and simple horticulture, on a very large scale. Time was required to perfect this garden—the Cubans call it paradise—of a cafetal; but when matured, it was a cherished home. It required and admitted of no extraordinary mechanical power, or of the application of steam, or of science, beyond the knowledge of soils, of simple culture, and of plants and trees.

For twenty years and more it has been forced upon the knowledge of the reluctant Cubans, that Brazil, the West India Islands to the southward of Cuba, and the Spanish Main, can exceed them in coffee-raising. The successive disastrous hurricanes of 1843 and 1845, which destroyed many and damaged most of the coffee estates, added to the colonial system of the mother-country, which did not give extraordinary protection to this product, are commonly said to have put an end to the coffee plantations. Probably they only hastened a change which must at some time have come. But the same causes of soil and climate which made Cuba inferior in coffee-growing, gave her a marked superiority in the cultivation of sugar. The damaged plantations were not restored as coffee estates, but were laid down to the sugar-cane; and gradually, first in the western and northern parts, and daily extending easterly and southerly over the entire island, the exquisite cafetals have been prostrated and dismantled, the groves of shade and fruit trees cut down, the avenues and foot-paths plowed up, and the denuded land laid down to wastes of sugar-cane.

The sugar-cane allows of no shade. Therefore the groves and avenues must fall. To make its culture profitable, it must be raised in the largest possible quantities that the extent of land will permit. To attempt the raising of fruit, or of the ornamental woods, is bad economy for the sugar planter. Most of the fruits, especially the orange, which is the chief export, ripen in the midst of the sugar season, and no hands can be spared to attend to them. The sugar planter often buys the fruits he needs for daily use and for making preserves, from the neighboring cafetals. The cane ripens but once a year. Between the time when enough of it is ripe to justify beginning to work the mill, and the time when the heat and rains spoil its qualities, all the sugar making of the year must be done. In Louisiana this period does not exceed eight weeks. In Cuba it is full four months. This gives Cuba a great advantage. Yet these four months are short enough; and during that time the steam engine plies and the furnace fires burn night and day.

Sugar making brings with it steam, fire, smoke, and a drive of labor, and admits of and requires the application of science. Managed with skill and energy it is extremely productive. Indifferently managed, it may be a loss. The sugar estate is not valuable, like the coffee estate, for what the land will produce, aided by ordinary and quiet manual labor only. Its value is in the skill and the character of the labor. The land is there, and the negroes are there; but the result is loss or gain, according to the amount of labor that can be obtained, and the skill with which the manual labor and the mechanical powers are applied. It is said that at the present time, in the present state of the market, a well-managed sugar estate yields from 15 to 25 per cent on the investment. This is true, I am inclined to think, if by the investment be meant only the land, the machinery and the slaves. But the land is not a large element in the investment. The machinery is costly, yet its value depends on the science applied to its construction and operation. The chief item in the investment is the slave labor. Taking all the slaves together, men, women and children, the young and the old, the sick and the well, the good and the bad, their market value averages above $1,000 a head. Yet of these, allowing for those too young or too old, for the sick and for those who must tend the young, the old and the sick, and for those whose labor, like that of the cooks, only sustains the others, not more than one-half are able-bodied, productive laborers. The value of this chief item in the investment depends largely on moral and intellectual considerations. How unsatisfactory is it, then, to calculate the profits of the investment, when you leave out of the calculation the value of the controlling power, the power that extorts the contributions of labor from the steam and the engine and the fire, and from the more difficult human will. This is the "plus x" of the formula, which, unascertained, gives us little light as to the result.

But, to turn to the changes wrought by this substitution of sugar for coffee. The sugar-plantation is no grove, or garden, or orchard. It is not the home of the pride and affections of the planter's family. It is not a coveted, indeed, hardly a desirable residence. Such families as would like to remain on these plantations, are driven off for want of neighboring society. Thus the estates, largely abandoned by the families of the planters, suffer the evils of absenteeism, while the owners live in the suburbs of Havana and Matanzas, and in the Fifth Avenue of New York. The slave system loses its patriarchal character. The master is not the head of a great family, its judge, its governor, its physician, its priest and its father, as the fond dream of the advocates of slavery, and sometimes, doubtless, the reality, made him. Middlemen, in the shape of administradores, stand between the owner and the slaves. The slave is little else than an item of labor raised or bought. The sympathies of common home, common childhood, long and intimate relations and many kind offices, common attachments to house, to cats, to dogs, to cattle, to trees, to birds—the knowledge of births, sicknesses and deaths, and the duties and sympathies of a common religion—all those things that may ameliorate the legal relations of the master and slave, and often give to the face of servitude itself precarious but interesting features of beauty and strength—these they must not look to have.

This change has had some effect already, and will produce much more on the social system of Cuba.

There are still plantations on which the families of the wealthy and educated planters reside. And in some cases the administrador is a younger member or a relative of the family, holding the same social position; and the permanent administrador will have his family with him. Yet, it is enough to say that the same causes which render the ingenio no longer a desirable residence for the owner, make it probable that the administrador will be either a dependent or an adventurer; a person from whom the owner will expect a great deal, and the slaves but little, and from whom none will get all they expect, and perhaps none all they are entitled to.

In the afternoon we went to the sugar-house, and I was initiated into the mysteries of the work. There are four agents; steam, fire, cane-juice and negroes. The results are sugar and molasses. At the ingenio, they make only the Muscovado, or brown sugar. The processes are easily described, but it is difficult to give an idea to the scene. It is one of condensed and determined labor.

To begin at the beginning. The cane is cut from the fields by companies of men and women, working together, who use an instrument called a machete, which is something between a sword and a cleaver. Two blows with this, slash off the long leaves, and a third blow cuts off the stalk, near to the ground. At this work, the laborers move like reapers, in even lines, at stated distances. Before them is a field of dense, high-waving cane; and behind them, strewn wrecks of stalks and leaves. Near, and in charge of the party, stands a driver, or more grandiloquently, a contra-mayoral, with the short, limber plantation whip, the badge of his office, under his arm.

Ox-carts pass over the field, and are loaded with the cane, which they carry to the mill The oxen are worked in the Spanish fashion, the yoke being strapped upon the head, close to the horns, instead of being hung round the neck, as with us, and are guided by goads, and by a rope attached to a ring through the nostrils. At the mill, the cane is tipped from the cart into large piles, by the side of the platform. From these piles, it is placed carefully, by hand, lengthwise, in a long trough. This trough is made of slats, and moved by the power of the endless chain, connected with the engine. In this trough, it is carried between heavy, horizontal, cylindrical rollers, where it is crushed, its juice falling into receivers below, and the crushed cane passing off and falling into a pile on the other side.

This crushed cane (bagazo), falling from between the rollers, is gathered into baskets by men and women, who carry it on their heads into the fields and spread it for drying. There it is watched and tended as carefully as new mown grass in hay-making, and raked into cocks or winrows on an alarm of rain. When dry, it is placed under sheds for protection from wet. From the sheds and from the fields, it is loaded into carts and drawn to the furnace doors, into which it is thrown by negroes, who crowd it in by the armful, and rake it about with long poles. Here it feeds the perpetual fires by which the steam is made, the machinery moved, and the cane-juice boiled. The care of the bagazo is an important part of the system; for if that becomes wet and fails, the fires must stop, or resort be had to wood, which is scarce and expensive.

Thus, on the one side of the rollers is the ceaseless current of fresh, full, juicy cane-stalks, just cut from the open field; and on the other side, is the crushed, mangled, juiceless mass, drifting out at the draught, and fit only to be cast into the oven and burned. This is the way of the world, as it is the course of art. The cane is made to destroy itself. The ruined and corrupted furnish the fuel and fan the flame that lures on and draws in and crushes the fresh and wholesome; and the operation seems about as mechanical and unceasing in the one case as in the other.

From the rollers, the juice falls below into a large receiver, from which it flows into great, open vats, called defecators. These defecators are heated by the exhaust steam of the engine, led through them in pipes. All the steam condensed forms water, which is returned warm into the boiler of the engine. In the defecators, as their name denotes, the scum of the juice is purged off, so far as heat alone will do it. From the last defecator, the juice is passed through a trough into the first caldron. Of the caldrons there is a series, or, as they call it, a train, through all which the juice must go. Each caldron is a large, deep, copper vat, heated very hot, in which the juice seethes and boils. At each, stands a strong negro, with long, heavy skimmer in hand, stirring the juice and skimming off the surface. This scum is collected and given to the hogs, or thrown upon the muck heap, and is said to be very fructifying. The juice is ladled from one caldron to the next, as fast as the office of each is finished. From the last caldron, where its complete crystallization is effected, it is transferred to coolers, which are large, shallow pans. When fully cooled, it looks like brown sugar and molasses mixed. It is then shoveled from the coolers into hogsheads. These hogsheads have holes bored in their bottoms; and, to facilitate the drainage, strips of cane are placed in the hogsheads, with their ends in these holes, and the hogshead is filled. The hogsheads are set on open frames, under which are copper receivers, on an inclined plane, to catch and carry off the drippings from the hogsheads. These drippings are the molasses, which is collected and put into tight casks.

I believe I have given the entire process. When it is remembered that all this, in every stage, is going on at once, within the limits of the mill, it may well be supposed to present a busy scene. The smell of juice and of sugar vapor, in all its stages, is intense. The negroes fatten on it. The clank of the engine, the steady grind of the machines, and the high, wild cry of the negroes at the caldrons to the stokers at the furnace doors, as they chant out their directions or wants—now for more fire, and now to scatter the fire—which must be heard above the din, "A-a-b'la! A-a-b'la!" "E-echa candela!" "Pu-er-ta!" and the barbaric African chant and chorus of the gang at work filling the cane-troughs—all these make the first visit at the sugar-house a strange experience. But after one to two visits, the monotony is as tiresome as the first view is exciting. There is, literally, no change in the work. There are the same noises of the machines, the same cries from negroes at the same spots, the same intensely sweet smell, the same state of the work in all its stages, at whatever hour you visit it, whether in the morning, or evening, at midnight, or at the dawn of the day. If you wake up at night, you hear the "A-a-b'la! A-a-b'la!" "E-e-cha! E-e-cha!" of the caldron—men crying to the stokers, and the high, monotonous chant of the gangs filling the wagons or the trough, a short, improvisated stave, and then the chorus—not a tune, like the song of sailors at the tackles and falls, but a barbaric, tuneless intonation.

Florida Grass.—Dr. S. S. Mills, of Charleston, S. C., has invented and patented a machine which prepares the grass of the Florida Keys for rope-making.

From Quarterly Journal of Agriculture.

Country and City Life.

(*From an Address deliverd at the Tennessee State Exhibition*, 1858.)

BY THE LATE POSTMASTER GEN. BROWN.

In this country the farmer generally holds an indefeasible title to the broad acres he cultivates. He moves proudly over his fields, and surveys with satisfaction the crops which are upon them. But he will not stop in his money making career to build his neat cottage, or his more costly mansion, according to his circumstances. He will not adorn his grounds, nor plant his orchards of delicious fruits. He will waste no time on shrubberry and flowers. He will prepare no healthful cistern, nor lead the gushing fountain to his door. All is left rude, inconvenient and uncomfortable around him, with nothing to lure either himself or his family away from the blandishments of some neighboring town or city. Every farmer and planter should make his home to himself and his household the dearest and loveliest spot on earth. Though he may have no marble palace, no rich and costly furniture, no liveried servants, still, there is his homestead beautified and adorned with every embellishment of taste and fancy. Who would be willing to leave such a home, with its Arcadian bowers and its pure and sparkling waters, for the dust and smoke of the crowded city?

And how strange is this passion for city over country life which we so often encounter! It cannot spring from any inordinate desire to grow rich, for agriculture rewards her followers more bountifully than any other pursuit. It is a passion for pleasure and display more than for riches. Some men desire to live in palaces built in the city, that they may be seen and admired. They desire costly equipages, but they must glitter in the city, attracting the admiration of thousands who would never behold them in the solitude of the country. The theatre, the ball, and the masquerade present their nightly attractions, whilst they are seldom heard of in rural life. The devotee of more questionable pleasures finds in the city ready facilities of indulgence, which are entirely removed in the plain and virtuous organization of country society. Whatever the motive, this preference given by so many to city life, is productive of some of the greatest evils of the present age. In the fondness of hope that something may chance to turn up in their favor, hundreds and thousands precipitate themselves into towns and cities without preconcerted arrangements for regular and permanent employment. It is the great law of our being, that if we would be either happy or prosperous, we must have employment, physical or intellectual. This is emphatically true of city life. But this disproportionate rush to the city renders such employment impossible; no demands of commerce, manufactures, or the mechanic arts can furnish it to the redundant crowds that pour themselves into our cities. Hence, that mass of poverty and suffering—for shelter, for fuel, for raiment, for bread—which no ordinances can relieve. Hence, also, those great mobs and processions through the streets in times of scarcity, demanding employment and subsistence, which oftentime nothing but martial law can subdue; and hence, too, that foul and festering mass of corruption and vice, which too often afflict and disgrace our over-crowded cities.

How delightful it is to turn from the contemplation of these scenes to the calm, contented, and virtuous life of the country, with its comfortable, and sometimes its magnificent mansions; with its outstretched lawns and landscapes, its churches and school-houses, its abundant supply of raiment, and almost boundless store of subsistence for man and all the animals that minister to either his necessities or pleasures!

Still, I must remind you that the great law of employment and labor applies equally to country and city life. It is by labor that man must work out the great problem of his existence—labor of the head, labor of the heart, and labor of the hand.

Wherever man has failed to labour he has remained a savage; where he has laboured most he has risen highest in the scale of his physical, moral, and intellectual being. If one Angel with his flaming sword drove Adam from his Eden, another Angel, though disguised in the humble form of Labour, will gently lead his descendants back to their native paradise. Look at the progress they have already made in that celestial and glorious direction. Look backward to the dark ages of man's existence, when he was a mere barbarian. Look at him now, how noble and majestic he stands, with all his temples dedicated to learning and piety, and good government around him. Once a savage, now almost a God.

Be not startled at the boldness of these words. The grandeur of what man has already done and is now achieving, must plead apologetic for the apparent impiety. He has scanned the Heavens, and almost numbered the stars; he has gently stolen away its lightnings and sent them over the land and through the deep waters, to convey his thoughts and wishes around the world; he has laid hold on another of the elements, and dispatched his huge ships in a few days over the widest oceans; he has levelled the mountains of the earth that impeded his pathway, and brought forth from their deep and hidden recesses the rich treasures they contained.

In the majesty of man's civilization and progress, the earth, the seas, and the winds, all stand subdued and conquered by his presence and power; and how animating is the reflection, my countrymen, that in all this improvement and progress, America, our young and vigorous America, holds so proud a pre-eminence. Her glorious form of government, stretching like the rainbow of hope and promise from ocean to ocean, gives shelter and protection to nearly thirty millions of the sons and daughters of freedom. Her luxuriant valleys, reposing in every climate, yield in superabundance every fruit and grain suited to the subsistence of man. Her mountains, teeming with ores and the precious metals, give employment to millions of artisans, and can furnish the long desired currency of gold and silver, the most stable and unerring standard of values and exchanges ever devised by the wit of man.

These great advantages of good government—of climate and soil—of mineral production—have stimulated the zeal and quickened the capacities of the American people, until they stand unsurpassed in agriculture, in manufactures, in the mechanic arts, in scientific pursuits, in the learned professions, and, indeed, unsurpassed in all the elements of national greatness.

But what avails our national greatness if we have not national and individual virtue to inspire us with obedience to law and a reverence for the glorious Constitution and Union under which we live! These are the sources of our unexampled growth and prosperity, and with his last breath every true patriot should fervently pray that they might last and endure forever:

"Our union of lakes and union of lands,
Our union of States, none shall sever,
Our union of hearts and union of hands,
And the Flag of our Union forever."

Wearing out Land.

"*Our land does not produce two-thirds as much now as it did fifteen years ago.*"

So writes a farmer from a region which cannot have been settled more than from twenty to thirty years.

Our reflection is, that the farmers there cannot be worth more than two-thirds as much as they would have been if they had so managed their lands as to increase instead of diminishing its productiveness.

There may be exceptions—some men may be keen enough to make money and wear out their land by the same operation. But the general rule is the reverse of this—that the most profitable husbandry improves the land, and that the husbandry which deteriorates the land is not profitable. We hold that a farmer of only ordinary means cannot afford to make his own land poorer; and that even if he were cultivating another man's land for a succession of years, he could not possibly afford to leave it much worse than he found it.

American Farmers' Magazine.

LESS LAND OR MORE LABOUR—WHICH?

We are not one of those who indiscriminately recommend small farms. We fear there is a tendency in small farms to make small men; and we deprecate the idea that the farmer is to be a man to be looked down upon by men in other callings. There has been enough of that in the history of this world, and we want to see the tables turned. Nevertheless it would be better to get a good living from ten acres than to fail of a living from a hundred.

In another place we have intimated that it is cheaper to make land more productive than to wear it out, as the phrase is; that if we enrich the land, it enriches us; and that if we impoverish it, it impoverishes us. Something like a demonstration of this would gratify some of our readers. This we will attempt; and what we have to say shall be in close connection with our motto, *Less land or more labour.*

That it is cheaper to raise a farm to a higher than to sink to a lower productiveness is our proposition; and what we mean by it is, not that it costs more labour to diminish than to increase the productive power of the soil, but that it does require more *unpaid* labour to wear out a soil by a ten years' cultivation than to enhance its productiveness in the same time.

To simplify as much as may be, we will suppose here are three acres, arable land, now in turf, and of a fair quality, to be cultivated respectively by A, B, and C, for the next ten years. A is a calculating, thinking farmer, in no way extravagant, but willing to expend money and labour where he sees a reasonable prospect of a return with profit. B is a careful soul, willing to labour, but as shy of all other expenses for crops as of the itch. C takes it easy, and will reap what his land will give, without giving it back much of either labour or manure.

Indian corn, we will suppose, to be the crop the first year. A turns over the turf in November to a good depth; harrows in fifty loads of compost in the spring, made, it may be, of twenty loads of barn manure and thirty loads of something which his industry and integrity have gathered up at a cheap rate for the purpose; plants the best variety of corn that he can get any certain knowledge of, about the middle of March; tends the crop well, and gets eighty bushels to the acre.

B wants all his manure for other crops, and thinks the turf land will do pretty well without manure. He plows in March, five or six inches deep, but very nicely. His team is not strong enough to plow much deeper; and as for paying for extra team work and manure to warm the deep soil that would be plowed up, he cannot think of it. Farming, in his opinion, is not a business to spend money in, but to get money by. But he plants in good season, tends the corn well all summer, and gets thirty bushels.

C takes it easy; plows when it is most convenient; plants and hoes when nothing hinders; does the work shabbily, according to his wont; and more by providential favour, than by his skill or industry, gets sixteen bushels of decent corn and plenty of *pig ears.*

Now B has done more work than C; A has expended more labour than either, besides costly manuring; and if the race ended here they might not come out so very unequally.

But suppose all three to follow the corn crop with rye, and seed with clover, herdsgrass and redtop in April. It is not unreasonable to suppose that A will get twenty-five bushels. B will have nothing to complain of if he gets fifteen bushels. If C gets more than ten he ought to be thankful. But these crops cost one no more than the other. And now A is fairly ahead—has been better paid for his outlay. But this is only the beginning.

The third year A gets two and a half tons of hay; B one and three-fourths, and C not more than one and a half at best; besides that, A's acre will pasture a cow well from the middle of July to winter, whereas the feed on B's and C's is of but little worth. Next year the disparity will be still greater, if all three acres are kept to graze without further manure. A's acre will produce more value, though perhaps less quantity, both of hay and fall feed, than the previous year. B's grass will have nearly, and C's quite run out. Neither will be much more than worth cutting; and as for fall feed, cows that are condemned to it will give little milk and make less butter; and if they have much pluck, will be apt to break fence and seek better fare, especially those on C's premises, where the fences cannot be expected to be over and above good. We suppose our readers have noticed that poor fences generally keep company with shallow culture and poor feed, on the principle that "Birds of a feather will flock together."

By this time the expenses of B's and C's cultivation will have been more than half as much as that of A, but A's return will have more than doubled theirs. Nor is this all. A's land has now a deeper, richer turf than theirs—is in far better condition for another round of crops.

We intended to have gone through with the remaining six years, but it is unnecessary. Our readers will understand that if calculating A, and careful B, and careless C were going on in their respective ways to the end of ten years, there would be a wide difference in the value of their acres for after cultivation. C's land would be pretty thoroughly worn out; B's would be ditto; and A's would be a great deal better than when he began. Is it not so? Has not A been better paid for what he has done and expended than the others?—and does it not follow that it is cheaper to enhance the productiveness of land than to diminish it?

Some will say it is all talk; there is nothing practical in it; let him try it, and he will find farming one thing and writing about it another. But our reply is, that we know the truthfulness of all this by actual trial, and we know it by the widest observation. If you cheat the land it will cheat you. "As a man soweth, so shall he reap." In a higher sense we have indubitable authority for this. In our application of it to soil culture, we appeal to the very best and most successful farmers, if it is not so. It follows that the farmer wants less land or more labour. The latter is our remedy. The farmer, it seems to us, should not ask how little help he can skim along with, but how much he can employ profitably.

And remember, farmers, that the more help you can employ, and yet secure a fair return to yourself, the better for the country; for you thereby afford encouragement to men to escape from the filth and wretchedness of our cities, and to seek an employment more favourable to whatever is virtuous, elevating, and patriotic.

It would be too much to ask the farmer to employ men to keep them out of idleness and vice, without a reasonable prospect of remuneration. But when such a prospect is presented, the farmer who rejects the opportunity sins against his own interest, and fails of being a benefactor where he might be one.

Agricultural Science----Mechanical Texture of Soils.

At a late meeting of the Farmers' Club, held at the American Institute, New York, Professor S. W. Johnson, of Yale College, furnished an able essay on soils, in which certain views were presented, which together with some facts, connected with our own observation upon the mechanical treatment of certain sandy and gravelly soils, seem to require the light of science to explain. We copy from the essay, the following remarks:

"The labors of chemists to discover positively all the causes of the fertility of the soils, have not yet met with conclusive success. The mechanical structure of soil is of primary importance. Naked rock grows lichen—the same rock crushed into coarse grains, grows a much higher order of vegetable—pulverized fine, the cereals grow in it. Geology, chemistry, botany, physiology, meteorology, mechanics, hydrodynamics, heat, light and electricity, are all intimately combined in the grand process of vegetation. There are sandy soils in our Eastern States, which, without manure, yield meagre crops of rye and buckwheat; but there are sandy soils in Ohio, which without manure, yield on an average, eighty bushels of Indian corn an acre, and have yielded it for twenty to fifty years in unbroken succession; the ingredients of these soils being, by chemical analysis, the same. At present no difference is known between them, except the coarseness of the particles,; the first being coarse, while the Ohio sand is an exceedingly fine powder. The power of soils to attract and imbibe moisture and oxygen, was well shown by Schubler, and Hoffen, forty years ago. Of thirteen different soils, quartz sand absorbed in thirty days over 1-1000 parts of oxygen and no moisture, while humus absorbed 13 of oxygen and 120 of moisture."

There is a piece of land, embracing sixty or eighty acres, within three miles of where we now write of the character of the fine sandy land of Ohio, as referred to by Professor Johnson. While in pursuit of land some years ago, we became acquainted with this piece, and from a knowledge of the character of the sandy land in some of the Eastern States, we were induced to place a very low estimate upon our neighbor's land. This land has since been sold and converted into a vegetable and fruit farm, and has proved to be one of the most sure and productive pieces of land with which we are acquainted. Of course, it is extremely warm and brings to maturity vegetables and fruit, some days earlier than any other land in the neighbourhood of the city; and for the growth of grapes, the fruit is almost invariably sound, while that grown in any other character of soil is subject to rot; and the capacity of this soil to retain moisture, is not surpassed by any other soil combining any portion of loam that we have seen. Probably the great secret of the fertility of this soil, lies in its capacity to absorb and retain heat, moisture and various gases essential to vegetable growth; and this is in consequence of the finely divided character of its particles, which renders it one of the most perfect and desirable soils to cultivate.

Last summer, while exploring certain portions of Long Island, in the State of New York, which is noted for its light, sandy and gravelly soil, we visited a gentleman's garden and nursery, to witness the effect of trenching a light, open, porous soil—purely sand, coarse gravel and stones, with a thin surface soil. This ground had been trenched, and entirely inverted to the depth of three and a half feet. Upon the surface a moderate dressing of manure had been cast and spaded in. On the trenched portion were growing various nursery plants, grape-vines, roses, &c., of great luxuriance; but the most remarkable feature was a few rows of cabbage, upon the same prepared ground, no head of which was less than ten inches in diameter, up to a much larger size, all firm and solid, while in the adjoining rows, planted the same time upon precisely the same soil, manured in the same manner, and spaded to the ordinary depth, but not trenched, not one cabbage had headed, but still remained large, loose plants.

In another fruit garden and vineyard of some magnitude, a mile distant, upon similar soil, but more sandy and less gravelly, resting upon a kind of marl or hard-pan bottom four feet below the surface, this ground had been trenched in a similar manner, with an incorporation of a compost of peat, stable manure, lime, ashes, &c.; and during three months' travel among gardens, we saw no more vigorous grape-vines, dwarf pear trees, or other fruit trees, even upon the richest soils of Western New York.

We had supposed that trenching such light thin soils, was worse than labor lost. But these instances prove to the contrary, and afford conclusive evidence that without this preparation of that kind of soil, gardening and fruit growing would not pay the cost. It also establishes the most important fact in agriculture, that the more perfectly the mechanical disintegration of the soil is effected, whether light or heavy, the more perfectly it is adapted to vegetable growth; and if such results are the effects of the deep culture of light soils, how much more important is it that more tenacious soils be deeply and thoroughly pulverized! The more perfect and free the circulation of heat, moisture, and the atmosphere, and gases in the surface soil, and in contact with the roots of growing crops, the more perfect will be their development.

The largest crops of corn we have on record, were grown upon the light sandy soils of the South; although upon thin, poor soils; but owing to their open, porous texture, with moderate dressings of manure and timely rains, these soils produced heavy crops. But such loose, sandy soils cannot be depended on, because of the uncertainty of a due degree of moisture in all seasons. Heavy soils are more retentive of moisture, and are more sure to afford regular crops; but the crops upon these soils would be greatly augmented by a thoroughly broken and pulverized surface. A deep and thorough breaking up in the spring is not sufficient for summer crops, but the surface must be kept loose and porous, during the growing season, or until the time of "laying by." In this lies the great secret of large crops.

[*Valley Farmer.*

Seed Saving.

It is a frequent "bone of contention" between gardeners and their employers, whether the former should grow and collect the necessary seeds for cropping the garden—most gardeners of experience preferring to purchase from a reliable source, rather than trust to their own savings; and most employers hold an opinion quite the reverse.

So far as regards economy the subject is not difficult to understand, as it can only refer to the collecting of such seeds as are the common produce of gardens, and provided and sold at all respectable seed stores. The trouble of watching and collecting these, as they accidentally ripen, will greatly depend upon circumstances. If economy is the only object, the matter will be easily determined, for if the amount of time, according to the estimated value of time and labor, is greater than the price of the same articles in the seed store, or otherwise, can readily be settled as the evidence preponderates. It is a fallacy to suppose, in such cases, that if the seeds are saved, there is just the saving of so much money effected. This is a great mistake. If the gardener takes time to gather seeds, he must necessarily be neglecting something else. My experience convinces me, that every six cents worth of seed saved in this way, costs the employer twelve cents. Seed growing is a branch of trade which competition has forced into a high state of perfection; and not only are the seeds sold at the lowest remunerative point to the grower, but the quality of the articles is in most cases infinitely better and truer to kind than the miscellaneous gathering to which I have referred can possibly be. No saving will recompense the use of inferior seeds; a spurious article requires the same amount of labor upon it as that of the highest excellence. Nothing can be a greater mistake, in ordinary garden management, than to suppose that a trifle saved in the price of seeds, or anything short of what will produce the best article of its kind, can deserve the name of economy. Of course exceptions are to be made, as in the case of a new variety of vegetable, superior to others of its kind, which it would be important to preserve; but this is a different affair to making a promiscuous collection of all kinds of common garden seeds to grow from year to year. The inevitable tendency of such a practice would be to hasten the degeneracy of three-fourths of ordinary vegetables to their primitive condition, as weeds of the wayside, or the sea shore.

With flower seeds the case is different. Many of these may be perpetuated in the same place, so long as it is only desirable to preserve the natural or original condition of the plant. But most garden esculent plants, such as peas, cabbages, brocoli, cauliflower, radishes, turnips, parsnips, &c., are in an artificial state, and to maintain them in their excellence, requires particular conditions, one of the most indispensable of which seems to be frequent change both of soil and climate—advantages which are not often possible to be secured in the same garden.

Even in the general saving of flower seeds, there are broad exceptions to the rule. Who would care to grow single Chinaasters, or single balsams? Yet although these produce seed freely, the plants from home-grown seeds soon deteriorate, and in countries where the production of these is made a special business, a special course of culture is resorted to in order to preserve their purity and excellence.

Looking at this subject in its proper light, it seems obvious that neither on the score of economy nor with a view to obtain superior stock, can it be desirable for gardeners to collect their own seeds, with the exception of some ornamental or rare botanical plants.—*Germantown Telegraph.*

From the American Agriculturist.

Enlarging a Farm Without Buying Land.

If a man does not know how much land he actually owns, and gets no benefit out of that part with which he is unacquainted, and then is informed that he has more, and is told how to use it, why is not this equivalent to the purchase of more acres? Farmers are often heard to exclaim: "Oh that I were rich enough to buy a little more land, then I could fatten more cattle and sheep, and I could carry more grain to market!" Now, to such men, at least to some of them, we beg leave to say, your farms are already larger than you suppose. You seem to think that your ownership extends only six inches deep into the earth; but this is a misapprehension. It is not very strange, however, since all the former owners of the soil had the same idea, and the Indians from whom your ancestors bought or stole the land, were content with only the surface, just enough to hunt upon and to grub a few roots out of. But this is all a mistake, as you will see on reflection. Examine the title deeds to your land and see if there is any limit to your rights in a downward direction. You will not find any; we know you won't.

Now, therefore, do not fear to go at once and take possession of the rest of your farm. It is virgin soil, covered over with only a few inches of partly worn land; and it will return you fine crops if you will only lay it open to the sun and air, or mix it with the soil you have long cultivated. Perhaps it will not be wise for you to try to use it all the first year; use a little moderation in entering upon your new property, for your own sake and for the farm's sake. [In connection with the advice here given, it may be well for the reader to turn back to page 71 (March No.,) and study what is said about plowing deep and plowing shallow.—Ed.]

Here is what some writer has said on the subject—not strictly correct perhaps, but highly suggestive: "At the present time, the average crop of wheat per acre in Great Britain on a soil cultivated for centuries, is about double that produced on the comparatively new soil of Ohio. Why is this? Simply because the leading British farmers are educated men, and apply their work wisely. They pay back to the earth what they borrow from her; they endeavor by every means in their power to enrich their ground, and in return it enriches them. If American farmers, instead of laboring to double the number of their acres, would endeavor to double their crops, they would find it a saving of time and toil, and an increase of profit. . . . Many men never think of digging ten inches into the soil, unless they have dreamed about a crock of gold, hid in the earth; but if they would set about the work of digging in earnest, every man would find his crock of gold without the aid of dreams or devination."

We once heard of some remarkable strawberries raised in a neighboring town, and called the "Washington Excelsior" strawberry. Rumor said that the leaves were large, vividly green all summer, the fruit large and abundant for a long time, and not diminished by the severest droughts. The plants were sold at a half a dollar apiece, and were considered cheap at that price. Attracted by these wonderful stories of the new fruit, we went to see it and learn all about it. The plants were indeed beautiful, and the fruit very fine. But our eyes were opened, when Mr. Smith, the owner, told us frankly, that the plants were some common sort, the name of which he had forgotten, but that they were grown on a bed in the corner of his garden, which was *made ground for at least six feet deep.* Why did this not account for the persistent verdure of the foliage and the size and abundance of the fruit? Yet, the superior beauty of the plants and berries had attracted much attention in the neighborhood, and seemed to call for a high sounding name; and so Mr. Smith dubbed them the Washington Excelsior. Plainly, this man's strawberry bed was enlarged without fencing in more land.

Mental Labor.

The injurious effects of mental labor are in a great measure owing to extensive forcing in early youth, to sudden or misdirected study; to the co-operation of depressing emotions or passions, to the neglect of the hints of the body; or to the presence of the seeds of disease, degeneration and decay in the system. The man of healthy palegmetic or choleric temperament is less likely to be injured by application than one of sanguine or melancholic type; yet these latter, with allowance for the original constitution, may be capable of vast efforts. The extended and deep culture of the mind exerts a directly conservative influence upon the body. Fellow laborer! one word to you. Fear not to do manfully the work for which your gifts qualify you, but do it as one who must give an account of both soul and body. Work, and work hard while it is day; the night cometh soon enough—do not hasten it. Use your faculties—use them to the utmost, but do not abuse them; make not the mortal do the work of the immortal. The body has its claims—it is a servant; treat it well and it will do your work; it knows its own business; do not attempt to teach or force if, attend to its wants and requirements, listen kindly and patiently to all its hints, occasionally forestall its necessities by a little indulgence, and your consideration will be paid with interest. But task it and pine it, and suffocate it—make it a slave instead of a servant, it may not complain much, but like the weary camel in the desert, it will lie down and die.—*Journal of Physiology.*

Effect of Bones and other Manures on Plants.

"That certain manures produce very powerful effect on various plants, was an early remark of the cultivators of the soil." An article exemplifying this statement, by C. W. Johnson, Esq., appears in the *Mark Lane Express,* from which we propose to condense a few paragraphs for our readers.

Phosphate of lime promotes in a remarkable degree the growth of clover. An instance showing this is related by Mr. Dixon, in his prize essay on the Manuring of Grass Land. A pasture of 20 acres was heavily dressed with broken bones nearly 70 years ago, and kept in grass without plowing.—The dry portions of the field was remarkably fertile, but such parts of the ground as were wet, had scarcely any other covering than carex and the coarsest grasses. Mr. D. on becoming tenant, set about draining the wet parts. In regard to this, he says:

"In the operation we found, at from five to eight inches from the surface, much bone, in various states of decomposition; the large pieces, when broken, appeared fresh inside. I felt at the time some regret that much value must have been lost for many years, and, as I then supposed, forever lost, on account of the manure having been in a soil saturated with water ever since it had been laid on. However, before my draining operations had been completed twelve months, the coarse herbage began to disappear, and in its place appeared white clover, marl clover, and others of the best pasture grasses; and in the secon l summer after being drained, the soil was equally luxuriant with the natural dry parts of the land."

Of another case it is said:

"Previous to boning, the herbage on these pastures were of the poorest kind imaginable—there being few of any plants except the small carex. In the second summer, after boning, the carex had disappeared, and the pasture had become long and thick-set with white clover, cow grass, or marl clover, and trefoil."

Messrs. Lawes and Gilbert, in the last half volume of the Royal Agricultural Society, report a course of experiments with different manures in permanent grass land. They sum up the result as follows:

"That the effect of a mixed, but purely *mineral manure* upon the complex herbage of permanent meadow land was chiefly to develope the growth of the *leguminous* plants (clover, &c.) it contained, and scarcely to increase at all the produce of the *graminaceous* plants, or commonly called *natural grasses.* That the action of purely nitrogenous manures upon the permanent meadow, was to discourage the growth of the *leguminous* herbage, and to increase the produce of the *graminaceous* hay. * * * That peculiar *carbonaceous* manures had little or no beneficial effect on the amount of produce of the hay."

We may see at home the change vegetation produces either by breaking up, or clearing land, by burning off the turf of mucky swamps, etc., and sometimes by turning up a lower strata of earth by deep plowing. Forests burned over, send up a thick growth of fire weed, followed soon by brambles of different kinds of trees and plants often introduced by occurrences which bring their appropriate food before them. They are not "spontaneously" generated, but grow from seeds lying dormant in the soil, or carried there by the wind, birds, or animals, and the subject is worthy of closer investigation, but we can devote no more space to it to-day.—*Country Gentleman.*

From the Conservatory Journal.

Relations of Air, Water, and Light, to Animal and Vegetable Life.

BY CHARLES T. JACKSON, M.D., STATE ASSAYER.

When an animal draws air into its lungs, and then exhales it, the expired air no longer will support flame, but the lighted taper, inserted in a receiver filled with it, is instantly extinguished.

If we now bring a branch of a living plant, having foliage, into this receiver, and expose the whole to sunlight, in a few minutes the air is restored to its original state and will support combustion.

On analysis, we find that the air which has been breathed by an animal, has lost the chief part of its oxygen, which is converted into carbonic acid gas. This gas is the respiratory food of plants, and the leaves, which are their lungs, absorb the carbonic acid, and by aid of the sun's rays decompose it, converting its carbon into its carbonaceous juices, fibre and cells; while pure oxygen is exhaled and the air is again rendered fit for the respiration of animals.

The same relations also exist in the action of the respiration of fishes, which draw from the air, dissolved in water, their respiratory element, while sub-aqueous vegetation absorbs their exhaled carbonic acid, and replace it by pure oxygen. The gills of fishes act in the same physiological manner as the lungs of air-breathing animals. They cannot decompose water, rich as it is in combined oxygen, but they depend on the small proportion of free oxygen which is dissolved in all water that has been properly ventilated.

These facts have now come to be popularly apprehended, since the aqua-vivarium has become so common in many households.—We shall proceed now to some details and generalizations on this and related subjects, to which we invite the reader's attention.

We live at the bottom of a great atmospheric ocean, between forty-five and fifty miles deep.* This ocean consists of nitrogen and oxygen gases, commingled, but not chemically combined. In addition to these two great components, there is a small proportion of carbonic acid gas, and variable proportions of aqueous vapor, also dissolved and intimately commingled with them. By the law of diffusion, gases become, in a short time, intimately and uniformly mixed, so that, though of different densities, they do not separate by gravitation. Were it not for this law, animals at the surface of the earth would soon be drowned in a stratum of carbonic acid gas, it being much heavier than air. Aqueous vapor is held in solution in the air, at a certain tension in ratio to the temperature of the air. When the air is cooled to a certain point, a portion of the water is condensed in the form of rain, snow, or hail; and when the earth, by radiation of heat, has its temperature lowered below the dew point, a deposition of moisture takes place on its surface.

The atmosphere consists of

	By weight.	*By bulk or measure.*
Oxygen,	23.10	20.90
Nitrogen,	76.90	79.10
	100.00	100.00

In addition, we have in bulk, on the average, 4-10,000, four ten thousandths of carbonic acid, and occasionally a little carburetted hydrogen, and ammonia; but these two last are accidental and irregular in their presence, depending chiefly on the abodes of men for their production.

Carbonic acid, in proportion of from three to six ten thousandths of the atmosphere's bulk, is essential to vegetable life, but much more of it would prove injurious to animals. Hence, Nature has nicely adjusted the powers of animal and vegetable life, so as to keep the atmosphere always exactly balanced with its due proportions of these gases, and by the winds, or atmospheric currents, prevents an undue accumulation of injurious gases from taking place in any portion of the globe. Simple and beautiful as these laws are, we should not neglect to contemplate and admire them.

If we now look to the composition of water, we shall find that it consists of,

	By weight.	*By measure of gases.*
Oxygen,	88.91	1
Hydrogen,	11.09	2
	100.00	condensed and combined chemically.

Rain water contains, dissolved in it, on the average, about 2½ per cent. of its bulk of air, in which the proportions of oxygen are, according to Guy Lussac and Humboldt,

* Recent researches seem to indicate that the height of the atmosphere is between seventy and ninety-nine miles. See Kaemtz' Meteorology, note by Charles Martins.

from 32 to 34.8 per cent., while the oxygen in the atmosphere is but 21 per cent. as before stated, oxygen being more soluble in water than nitrogen.

This dissolved, but not chemically combined oxygen, is essentially necessary for the life of fishes, and of all sub-aqueous animals, and the rain supplies it in part; while subaqueous vegetation, under influence of sunlight, also contributes to furnish oxygen; and at the same time, the plant withdraws carbonic acid from the water.

After a long season of drought, water in our small lakes and pools, becomes stagnant, as happened a few years since to Cochituate Lake, which supplies Boston with water by its aqueduct. Then immense quantities of microscopic confervæ, of a bright green color, appeared in the water, and it had then a peculiar disagreeable taste and smell, which was compared to that of cucumbers, and by some to that of fishes, but which really was nothing more than the odor of this microscopic plant. It seems that this low order of vegetation is favored by the diminished supply of oxygen from rain, and the prevalence of carbonic acid in the water. Whether the subsequent rains, or the sudden increase of minute Crustacea, Cyclops, Daphnea, etc., caused the disappearance of these confervæ, we do not know; but it is certain that a large increase of these minute creatures suddenly accompanied the clearing of the water from the peculiar taste and smell, which for some months so annoyed our citizens, and that the microscopic confervæ gradually diminished in quantities, if it has not wholly disappeared. The Cyclops certainly is quite abundant, when the water is the sweetest and considered most pure. We wish to discharge these animalculæ from any imputation of having tainted the waters of Cochituate Lake, for we believe that they were not guilty. Pray, reader, excuse this digression, for this matter was once a subject of animated dispute in this city, and the public generally do not know how the question was finally disposed of. We give our opinion, for what it may be worth, observing at the same time, that for years this subject has been one of frequent researches in our laboratory; and has also been duly investigated, with the same results, in the scientific school of Cambridge; Prof. Horsford having first noticed the microscopic confervæ in the water, and mentioned then in his Report to the water board.

The sun's rays have the power of aiding in the formation of organic matters. By their aid the foliage of plants, whether subærial or sub-aquatic, decompose the carbonic acid gas of the air, or that dissolved in water. Only the lowest orders of vegetable life can grow in darkness, namely, the Fungi, (mushrooms, etc.) which it is well known will grow in the darkness of the catacombs Paris, or in the galleries of mines, where no light enters.

The higher orders of vegetable life require sun-light for their growth, and their power of abstracting carbon from this gas is truly wonderful, especially when we know, from chemical experiments, that the most powerful of our electro-positive elements—potassium, is required, and that, too, at a red heat, to decompose carbonic acid, so as to set free its carbon while the oxygen combines with potassium to form potash. Now the plant takes the carbon, and liberates the oxygen from this gas; two atoms of oxygen for every atom of carbon which it absorbs. Dumas says, if we place a branch of a tree, in full foliage, in a globe, and blow a blast of air over the confined foliage, while the sun shines on it, all the carbonic acid will be taken from the air by the plant, during this momentary contact with the leaves of the plant. It is a certain fact of science, and not a mere figure of speech, when we say, we draw the air into our lungs, and throw it forth unfit for animal respiration; the leaves of the trees catch this foul air and return it to us in the form of fruit, flowers and fuel.

Enterprise and Obstacles.

No higher eulogy, aside from considerations of a religious nature, can be pronounced upon any man, than that he was one possessed of energy of character commensurate with every undertaking—an ardor vigorous enough to surmount all difficulties, especially such as came inadvertently in his way.—That he could sever the gordion knot of difficulty by one masterly blow; and that he was one of those fearless, resolute, and enterprising men, who, when thrown upon the world without friends and without resources, could make his progress through it smooth and triumphant, and could even gather grapes of thorns, and figs of thistles.

Under any circumstances, no matter how unfavorable, to rise from an humble station in life to places of eminence and usefulness, and to retain these places without any particularly favorable external circumstances, but solely by the energy of his own character, and the fertility of his personal resources, argue a truly great man. Strength, bravery, dexterity, and unfaltering nerve and resolution, must be the portion and attributes of those who pursue their fortune amidst the stormy waves of life. It is a crowning triumph or a disastrous defeat; garlands or chains; a prison or a prize.—We need the eloquence of Demosthenes to plead in our behalf—the arrows of Hercules to fight upon our side.

The severe trials and hardships of life call into exercise the latent faculties of the soul of man. Incentives to virtue and superiority, they are prepared and predestinated for him, to put his manhood to the test, and to inculcate in him strength, hardihood, and valor. Pusillanimous and feeble *without* great exertions, he is only what he was designed to be when he makes them; and forms a commendable and heroic resolution not to let life pass away in trifles, but to accomplish something even in spite of obstacles, but more especially if they do not exist. At slight difficulties he will not be dismayed, nor magnify them by weakness and despondency, but boldly meet them and put them to flight.

There are cobble-stones in every road, and pebbles in every path. All have cares, disappointments, and stumbling-blocks. Sobs and sighs, groans and regrets avail not. All have need of heart and mind, wit, wisdom, address, management, patience, and perseverance. Besides, most difficulties are merely imaginary. In the Homeric ages virtue and glory were identified, but always implied greatness of soul, great exploits, and great honors.

"Twined with the wreath Parnassian laurels yield,
Or reaped in iron harvests of the field."

It is indolence and deficiency of spirit which produce torpor and stagnation; for both in the daily difficulties of life, and in the arduous career of moral greatness, dangers and impediments abound, as well as in the perilous triumphs of heroism; but we perceive them not. The contest reveals them, and shows how difficult and onerous is the task of zealous and active goodness—of resolute and determined virtue—of patient and consistent fortitude—of useful and laudable exertion and enterprise.

Pressing emergencies are to be met with which demand talents, wealth, power, energy, character—in short, every possible help and advantage to extricate ourselves with honor and success from the straits and difficulties in which we are placed. "He," says one, "who weakly shrinks from the struggle, who will endure no labor, nor fatigue, can neither fulfil his own vocation, nor contribute aught to the general welfare of mankind."

The difficulties of life teach us wisdom, its vanities humility, its calumnies pity, its hopes resignation, its sufferings charity, its afflictions fortitude, its necessities prudence, its brevity the value of time, and its dangers and uncertainties a constant dependence upon a higher and All-protecting Power.—*Waverley Magazine.*

Francis Gillet on Gravel-Wall Houses.

Having been often asked my opinion of the concrete or gravel-wall style of building, whether it is equal or superior to other styles, and its relative cost—I take this mode of answering the inquiry, for the information of all persons, who may feel interested on the subject.

I am every way pleased with the *gravel wall*, and think it superior, in all respects, to any other. It is now nearly three years since I built a large square-walled dwelling house of this material, and I have found it to combine every quality desirable in the walls of such a structure. It is *permanent*, not having settled or cracked. It is *warm* in winter, and *cool* in summer. It is entirely *free from dampness*, even in the dampest dog-days, no moisture having at any time been detected on the interior surface, though plastered directly upon the wall, without furring out, as is customary in stone or brick walls. Having formerly occupied a stone house, which was at times damp, though furred out with great care, the contrast in this respect is very noticeable. Being thus plastered directly upon the wall *it affords no harbor or race course for vermin*, to chase up and down at all hours, day and night, more to their own amusement than the entertainment of the helpless occupants within. *It holds the stucco perfectly*, the stucco being rough and admirably suited to this style of finish.

It is cheap, costing in this vicinity, where gravel and filling-stone are easily obtained, about one-third the price of brick. Indeed, with my present experience, I could build at a less comparative cost, perhaps one-quarter.

All things considered, I am so well satisfied with the concrete or gravel wall that should I build again, I should prefer it to any other material with which I am acquainted even at the same cost.

In conclusion, I will volunteer one suggestion as to the manner of constructing the wall. I pursued the common mode and used "flasks," or boxes in laying the wall. Were I to build again, I should cast the material beforehand, in rough boxes of the width of the wall and of any convenient length, and lay the blocks thus cast into mortar, this mode has many advantages.—All danger from rain while the walls are still green and liable to washing is thus obviated; the walls can be made perfectly true and perpendicular without the constant trouble of moving and adjusting the flasks, which are very liable to be moved out of place; juts and angles can easily be accommodated to the shape of the wall, and the builder's taste can be gratified in this respect as readily as by other material. Instead of the square or octagon form, best suited to the flask mode of construction, he can adopt the cottage, or any other style, however irregular and angular.

I shall be pleased to communicate any information which my experience may have afforded me, in relation to the details of this mode of building, believing it to be highly conducive to the promotion of domestic economy and comfort.—*Homestead.*

FRANCIS GILLETTE, *Hartford.*

For the Southern Planter.

Mr. Baker's Apples.

LOUDON CO., VA., 5th Mo. 18th, 1859.

In the issue of the Planter for this month is a communication from H. M. Baker of Winchester, on fruit growing, and speaking highly of a native fruit of that section as a valuable keeper. The description corresponds to an apple that is a native of that county, and known as Ross' Green. It was brought into notice by the late Abraham Branson, under these circumstances: he was at the house of a neighbor of the name of Ross, when he was opening a hole of buried apples in the Spring, and observing one variety less rotten than the others, he asked to be shown the tree from which these were taken, when he took some grafts and put them in his own trees. The trees thus grafted have been very profitable since, and now belong to his son, Joseph Branson; but as the trees became old they seem to be more addicted to the bitter rot than formerly. I introduced them here in this county, some years ago, but they seem more inclined to rot while the trees are young than in the limestone soils near Winchester. We now do not cultivate them. My own opinion is, that in a strong limestone soil, while the trees are young they do well and are good bearers, but in lighter soils are not so good. The apples are of fine size, green in the fall, becoming yellowish green in the spring; very fine, brittle and juicy.

If this apple of H. M. Baker's is different from the Ross Green, and he can ascertain the fact by enquiry of Joseph Branson of Frederick county, I shall be pleased to exchange grafts with him, and as the promulgator of a fruit is, by the common consent of pomologists, entitled to christen it, he may himself give it a name.

YARDLEY TAYLOR.

From the U. S. Patent Office Report.

Investigation of the Sugar-Bearing capacity of the Chinese Sugar-Cane.

BY PROF. J. L. SMITH, OF LOUISVILLE, KENTUCKY.

On investigating the sugar-bearing capacity of the Chinese sugar cane, the first step required was to ascertain the true chemical constitution of the juice extracted from the plant. From various conflicting statements on the subject, nothing satisfactory could be gleaned, some of the best authorities insisting that there was not any crystallizable sugar in the juice, or but a very small portion, while others, equally as strong, held the contrary opinion.

There are two kinds of sugar of common occurrence, namely, glucose, or grape sugar, (a sugar moderately sweet and difficult of crystallization,) and cane sugar, with a very sweet taste and easily crystallized. The first form of sugar occurs most abundantly in fruits—the latter in the sugar cane, the beat-root, maple, melon, &c. I would remark, in addition, that cane sugar is easily convertible into grape sugar, and, in all processes for extracting the former, one important aim is to prevent the transformation. For instance, were we to take the juice of the sugar cane, (containing about 20 per cent. of crystallizable sugar,) and concentrate it without subjecting it to the action of lime or some other defecating agent, fully half of the sugar would be rendered uncrystallizable, and there would be only a small yield of sugar but a large amount of molasses. For this reason in regarding the sugar-yielding capacity of any vegetable, the two facts to be considered are, first, the quantity of cane sugar it contains, and secondly, the amount and character of the impurities associated with the sugar—for the latter, during the concentration of the juice, may give rise to the alteration already mentioned, or they may prevent the sugar from crystallizing without altering it.

The juices of the sugar cane, beet-root, and maple, present about the best conditions of any of the vegetable juices for furnishing sugar, and according to the care and skill exercised in the working of them so is the yield of sugar.

Without further preliminaries, I will proceed to state the results of the investigation of the *Sorgho sucre*, as far as possible to make it at the present time. Owing to the season being far advanced when the experiment was commenced, it was impossible to undertake anything more than a chemical examination of the juice, as the frost had already affected most of the cane which was not cut. Here I would remark that it is of the utmost importance to examine plants perfectly fresh and unaltered, if we expect correct results in relation to the crystallizable sugar they will produce; and it is a well known fact that even the broken and bruised canes of a field will deteriorate the juices, if passed through the mill with the perfect canes. Even on the surface which is cut, an alteration commences, at once the sugar is changed, and this alteration gradually creeps from the cut extremity into all joints of the stalk. I have verified this fact in relation to the sorgho. By examining different joints, after it had been cut two or three weeks, the results were as follows, the joints being numbered from the extremity next to the root:

Juice from joints.	Crystallizable sugar.	Uncrystallizable sugar.
1st jt. contained	6 per cent.	7 per cent.
3d jt. contained	8 per cent.	4½ pr. cent.
5th jt. contained	9½ pr. cent.	4 pr. cent.

Hence it is evident that no time is to be lost, after cutting it, in expressing the juice.

Not being able to supply myself with the fresh cane as needed for examination, the structure of the plant, with reference to its sugar-bearing cells, was not investigated. My inquiries, therefore, were directed to the more important study of the composition of the juice.

Some of the sorgho, perfectly matured and recently cut, was compressed, and the juice submitted immediately to analysis. The process adopted for ascertaining the quality and character of sugar is the only one that can be relied on for anything like accurate results. It is known as the process by polarized light, in which the juice to be examined is first made in a few moments as transparent and colourless as water, and that without the agency of heat. The juice as compressed is of a light green colour, opaque, and largely mixed with cellulous tissue from the plant. It is readily clarified by acetate of lead, and when thus submitted to examination by Soliel's polarizing saccharometer, three specimens gave the following results:

No. of specimens.	Crystallizable sugar.	Non-Crystallizable sugar.
1st.	10 per cent.	1½ per cent.
2d.	9½ per cent.	2 per cent.
3d.	10 per cent.	2 per cent.

The result settles the question that the great bulk of the sugar contained in the sorgho is crystallizable or cane sugar proper.

The difference of opinion which has existed on this subject, doubtless arose from the fact that different degrees of care had been taken in the concentration of the juice, or that a more or less perfect process of defecation was resorted to, sometimes rendering the juice altogether crystallizable, while at others it furnished a reasonable quantity of sugar.

The results obtained in the analysis of liquids containing sugar by polarized light are especially valuable, as the impurities which may be associated with the sugar in no way affect the accuracy of the analysis, the only requisite being to render it perfectly transparent. Besides the sugar and water contained in the sorgho, the following constituents are found: Cellulose, woody fibre, pectine, pectic acid, albuminous matter, phosphates, sulphates, oxalates, potash, soda and lime salts, starch, and aromatic matter, (probably a volatile oil.) Owing to the complex nature of the juice, and the difficulty of its examination, some of the constituents (existing in small quantities) may have been overlooked, but the prominent ones are those recorded in the above list.

Further examination made upon pieces of the stalk showed it to be constituted as follows:

	Per cent.
Water,	75.6
Sugar,	12.0
Woody fibre, salts, &c.	12.4

So were it possible to compress all the juice from the cane, there would be a yield of 87.6 per cent. In some operations, by compression, I have obtained a yield of 66 per cent., but I do not think that the ordinary method of passing the cane between the rollers furnishes over 50 per cent. of juice.

The following table gives at a glance, the composition of the Sorgho sucre, the sugar-cane, and the beet-root:

	Sorgho.	Sugar-cane.	Beet-root.
Water	75.6	72.1	83.5
Sugars	12.0	18.0	10.5
Woody fibre and salts	12.4	9.9	6.0
	100.0	100.0	100.0

Satisfied as to the composition of the sorgho juice, the next step was to examine into some process of separating the sugar. The first method tried was the one transmitted from the Patent Office, and proposed by Leonard Wray. It consisted in treating the cold juice with lime, filtering, then treating with a solution of nut-galls, filtering, again treating with lime, filtering and evaporating to proper consistency, and allowing it to crystalize. This method did not succeed in my hands, the juice becoming very much blackened. All subsequent experiments were made with those methods already successfully practised on the juices of the sugar-cane and beet-root.

The first of these methods is to take the fresh juice, heat quickly to 130 deg. Fahr., add sufficient lime to enable the solution to act on reddened litmus paper, filter, evaporate about a third of the liquid, filter through well-washed animal charcoal; evaporate at a temperature not exceeding 220°, and when sufficiently concentrated, set aside to crystalize.

A second method, which I prefer to the one last mentioned, is to warm the fresh juice rapidly to 120°; then add to each gallon of juice three ounces of lime, first slaking it with five or six times its weight of water, then bringing the temperature up to 200°. It is then filtered, and carbonic acid passed through the juice, afterwards filtered and evaporated to a proper consistency for crystallization. Each time that the juice is filtered, if it be allowed to pass through well-washed animal charcoal, the syrup may be made very clear, and the sugar prepared from it will be perfectly white. During the evaporation the temperature should at no time exceed 215 degrees.

It often happens that we have to wait days and even weeks for the crystallization to take place; but it may always be hastened by adding to the thick syrup, when cool, a few grains of brown sugar, or a little pulverized white sugar.

I do not profess to give the methods described as those best adapted to the extraction of sugar from the sorgho, but there are others not yet experimented with, which may succeed better. Although much of the sorgho syrup which I have tasted is far from being agreeable, yet, when properly prepared, it cannot be readily distinguished from that of the sugar-cane of the tropics.

It must not be forgotten that sugar making is an art that cannot be practised by every one with a mill and a set of kettles; and, moreover, that the sugar making at present is a vast improvement on that of former days, and where those improvements are not employed, the process is carried on to a disadvantage. Also, in extracting sugar from one vegetable, we are not to expect to apply successfully those methods practised on other vegetables. It was not by applying to the beet root the method of extracting sugar from the cane that France is now able to produce 120,000,000 pounds of sugar from that root, a quantity equal to one-half of what is consumed by her entire population of 30,000,000. Beside, it was not in a year or two that the beautiful and economical processes now employed were brought to their present degree of perfection. What was necessary for the beet root is doubtless required for the sorgho, namely, thorough study of its nature, with a process of extracting the sugar specially adapted to it.

In regard to the economical results to arise from the cultivation of the Chinese sugar cane, I have no data upon which to form a correct opinion, as it would require an entire season, at least, to go over the subject, and to examine the plant in its different stages; also to examine its fixed principles, and ascertain its exhausting effects on the soil. As already stated, the cane examined was in a perfectly matured state, but I have been informed that in the earlier stages there is more sugar in the plant. If this be true, an investigation should be made of its sugar bearing qualities in the different periods of its growth.

The economical value of this plant in regard to its sugar or syrup, is far from being settled, even should the syrup be readily converted into sugar. It grows in a temperate climate, it is true, but so does the beet root, which, under skilful cultivation and a well directed manufacturing process, will yield from 1,300 to 2,000 pounds of sugar to an acre.

The following are the most important facts established by the present inquiry:

1. The sorgho contains about 10 per ct. of crystallizable sugar.

2. The sugar can be obtained by processes analagous to those employed for extracting sugar from other plants.

3. The uncrystallizable sugar forms rapidly after the cane is fully ripe and recently cut.

The present investigation I regard only as a preliminary to the proper study of the plant in question. Some of the points yet remaining for investigation are:

First, the composition of its ash, compared with that of the sugar cane, in order to learn its requirements of soil, when compared with those of the latter.

Secondly, the analysis of the plant in certain stages of its growth, and from different localities, to learn when it contains the largest amount of sugar, and what latitude is most favorable to its development.

Accompanying this report are specimens of syrup and sugar; the former transparent and of a light wine color, the sugar perfectly white and fine flavored.

☞ The violet grows low and covers itself with its own tears, and of all flowers yields the sweetest fragrance—such is humility.

The Southern Planter.

RICHMOND, VIRGINIA.

The War in Europe.

In calculating the advantages likely to accrue to the agricultural interests of this country from an increased demand,—at enhanced prices,—for breadstuff, for exportation, we are too prone to overlook, or forget, the many drawbacks upon our otherwise prosperous condition, arising from the obvious effects of a foreign war upon *the currency* of the country. Among these we notice the first—after the fitful agitation of the Food Market—to be, a largely increased demand for gold, and *a decline* in most other commodities, proportionate *to its rise in value*,—a stringency in the money market consequent upon its abstraction, and a curtailment of that part of the circulating medium based upon it, and purporting to represent it,—consisting of credit, and composed *primarily* of the promissory notes of banks, and *secondarily* of those of merchants and other classes and corporations. A medium so sensitive, that like an Æolian Harp, in all but its melody, gives forth notes of alarm and distress at the touch of every breeze that blows, and like the atmosphere, all the lighter for its expansion, losing power in proportion to its attenuation, but very unlike it in this: *that it is least to be relied upon when most needed*—an inflated balloon in the flush times of prosperity—a millstone about the neck in the time of adversity. Yet, unstable and fluctuating as the currency is, for that reason it is the better fitted to subserve the purpose of a barometer, to note the perturbations and changes constantly occuring in the monetary atmosphere, and by which to foresee the storms and calms, and clouds and sunshine which alternately darken or brighten the horizon. We shall, from time to time, notice the operations in the money market, as affording to our readers the means of judging for themselves of the course which may seem best for them to pursue in the sale of their productions, and in the purchase of property for permanent investment, or commodities for their consumption.

As germain to our purpose, we now call attention to the following article, extracted from the United States Economist:

RATES OF INTEREST IN EUROPE.

The occurrence of the war produced an immense derangement in the money markets of Europe, as well as fall in prices. The first shock caused a depreciation in stock values which has been estimated at $1,000,000,000, and over 300 failures of banking and commercial firms have been reported, whose liabilities are not short of 300 millions, and the effects of which are now corrupting the standing of those still existing. The demand is only for gold, and values of all kinds sink in comparison with that; at the same time there is no demand for capital for any business or commercial enterprises. There are few merchants of England, or Western Europe, who will project ventures to other countries when the course of war is so uncertain, and the demand for all sorts of merchandise is so much diminished that no one demands capital to embark in it, hence, although gold is actively running out from the great reservoirs, the supply of capital at the leading centres is increasing, seeking employment at lower rates, but this only on the most undoubted securities. The first panic of the war caused a demand to extinguish obligations, and the rate of interest rose. That accomplished, the rates are again falling for investments where the security is undoubted. The following are the rates of interest at the leading centres:

	Hamburg.	Bremen.	Frankfort.	Berlin.	Antwerp.	Amsterdam.	Leipzic.	Vienna. gold.	Paris.	London.
Dec. 23	2¼@2¾	3	4	4	3	3	5	5—101¼	3	2½
April 1	3½@3¼	3	3½	5	3	3	5	5—108	3¼	2½
April 15	3½@—	3½	3½	5	3	3	5	5—112	3¼	2½
April 27	5½@—	7	3½	5	4	3	5	5—120	3¼	3½
May 3	5 @—	6	3½	5	4	3	6	5—143	4	4½
May 17	4 @—	6	4½	5	4	3	6	5—145	4	4½
May 23	2½@—								4	4½

The rate was first to rise at Hamburg, and it declines there the first, after the pressure to meet obligations has passed. The demand for gold is, however, everywhere active, and the degree in which it rises is apparent in its agio at Vienna, where the bank is suspending payments and emitting paper money, and maintaining its rate of interest. The agio has risen with the Exchange on London from par to 145, and the demand for the metals is everywhere met with its concealment and export. The reservoirs subject to the demand for the metals are more chary of those demands, which have for an object the obtaining of it for export. In New York the outward current of the metals has been very large. The amount of specie in the city has been reduced during the month of May about $4,700,000. In the same period last year there was an increase. The export from Boston and New York, together, for May, has been $12,632,511. The diminution in the banks of four cities has been as follows:

	Loans. May 1.	Loans. June 5.	Specie. May 1.	Specie. June 5.
Boston	$58,178,264	57,328,243	6,726,647	6,700,975
New York	128,706,705	125,006,766	32,898,400	28,055,400
Philadelphia	27,747,339	26,406,458	6,689,591	5,521,759
New Orleans	19,926,487	18,594,556	15,650,736	14,784,944
	$234,538,795	227,326,023	61,985,374	55,063,078

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Lindsay & Blakiston, Publishers, Philadelphia.

Having enjoyed the opportunity of examining the manuscript of the above work, (which though ready for delivery, has not yet reached us in print,) we can, with great confidence, recommend it as eminently worthy of general circulation among farmers, as a concise, accurate and systematic treatise, calculated to impart the most valuable instruction in respect to the science and practice of agriculture, and "reduced to such a form that it may be applied to the daily business" of the farm. It is truly "A Book for every Farmer and every Farmer's Son."

Southern Field and Fireside.

We have received the two first numbers of the above paper, published weekly in Augusta, Georgia, by James Gardner, at $2 per annum, always in advance, and edited by Dr. Lee in the Agricultural, W. W. Mann in the Literary, and Wm. N. White in the Horticultural department.

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The high reputation of Dr. Lee, as an Agricultural writer, will make the paper a welcome visitor to the Southern Planters and Farmers; and we have no doubt but that the other departments will be equally well sustained. We commend it to the attention and patronage of our readers. The Publisher offers the following prizes to Southern Writers:

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For the best Agricultural Essay,.........	50
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For the best Poem, less than 60 lines,....	25

Natural Agriculturist.

A new paper, published at Pittsburg, and edited by J. T. F. Wright, proprietor, at $1 per annum---a quarto of 8 pages, well filled with original and selected matter. We wish it a useful and prosperous career.

Acknowledgment.

We received from H. J. Smith, Esq.,---who is already distinguished for the superiority of his fruits and vegetables,---specimens of six varieties of Raspberries---Allen's Hardy, Antwerp Red, Pringle's Orange, Pringle's Red, Cattawassa, and Fastolf---all of which are very fine,---the two varieties first named superb. We also received, while they were in season, several remarkably fine samples of the varieties of the Strawberry cultivated by him. He intends to enlarge the allotment of land for the growth of these luscious fruits.

Scientific American.

There is no one paper to which we are more indebted for valuable articles, with which to enrich our own pages, than to the Scientific American, and there is none, therefore, that can have higher claims to courtesy at our hands, or in whose prosperity we take a deeper interest. It gives us pleasure to insert its prospectus below, by which it will be seen that important improvements and considerable enlargement are in contemplation. Now is the time for new subscribers to enter their names:

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OF THE

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ENLARGEMENT.

Vol. 1., No. 1—New Series.

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With the enlargement of the Scientific American, we shall be enabled to widen the sphere of our operations, omitting none of the features which now characterizes it, but adding many new ones, which will render the work more valuable to all classes of the community than it has heretofore, among which is the devoting of space to a Price Current, and a column or two to the Metal and Lumber markets, and such other branches of trade as may be interesting and useful.

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From the British Farmer's Magazine.

The Principles that should Guide the Farmer in Breeding Stock, with more especial reference to Horses.

A quarterly meeting of the members of the Wenlock Farmers' Club was recently held, at the Raven Hotel, Much Wenlock, to hear Mr. Griffith Evans, of Bridgnorth, deliver a lecture upon "The principles that should guide the farmers in breeding stock, with more especial reference to horses."

In the absence of the President, the Rev. H. R. Smythies was called to the chair.

The lecturer began by contrasting the present Shropshire-down sheep with their ancestors thirty years ago, and he showed how that the great improvement had been made by breeding upon some scientific principles. Yet he was persuaded that many follow the new system who are not acquainted with the principles. They do it because it is the fashion, and answers the purpose better—not knowing the why and the wherefore it should answer better. He should therefore draw their attention to Nature's laws of breeding. The same law is applicable to all animals, only, of course, requiring certain modifications which their good sense might easily direct. It is a lamentable fact that horse-breeding is very much neglected throughout the country, especially hunters and carriage horses; nor has the draught horse had the attention he deserves. He (Mr. Evans) should, therefore, more especially point out how to apply the principles of breeding to horses than to other animals. Mr. Robert Smith, in his excellent "Report on the Exhibition of Live Stock at Chester," published in the last volume of the *Royal Agricultural Society's Journal*, says that "The breeding of the horse is a national subject, but as yet has not been treated as such. There is a want of system in our arrangement and management." He quite agreed with Mr. Smith. Our fairs are overstocked with horses, but so shapeless that it is difficult to say for what purpose most of them are adapted. He thought he might safely say that the average value of four-fifths of our four-year-old horses, of all sorts that we see in the fairs, is hardly £20 to £25, and it is difficult to sell many of them at any price. Now, taking into consideration their cost of breeding and rearing, with all risks and so on, no wonder, then, breeders say they do not pay. The average value of the remaining one-fifth it is difficult to say; but they sell readily for from £40 up to almost any amount you can reasonably conceive. Now, I ask those breeders who complain, why do they breed horses at all? "Oh," they say, "to consume the grass properly we must have cattle, sheep, and horses, too,—they all differ in their bite so." Very well, then, if you breed horses of some sort, why don't you breed good ones? Does an ill-shaped horse consume less food than a good one? Is it cheaper to breed poor than good horses? My motto is this always: "If it is worth my while to do a thing at all, it is worth my while to do it as well as I possibly can;" and I have no hesitation at all in saying that it would pay you as well as anything to breed real good horses. Some of you may perhaps say, as I have heard others say, that in breeding cattle and sheep you are seldom disappointed; the progeny is always what you expected; while in breeding horses you have no idea what the colour or shape of the colt will be until you see it, it is quite a lottery. It may be this: it may be that. You hope the best, and the worst will disappoint you; for you do not believe in horse-flesh. Thank you, my dear friend, that is a candid confession at any rate, which goes so far as to prove that you have never practised horse-breeding upon right principles. Before I came here I lived in Lincolnshire. There, good horses are comparatively plentiful; much better than those bred in Shropshire, taking all together. You excel in sheep; I wish you to excel in horses, too; I wish to see dealers flocking from all parts of the world to Shropshire for horses. I wish to see the tide turned from Lincoln and Horncastle fairs to Shrewsberry and Bridgnorth; or, at any rate, to see the trade as strong here as there. It is not impossible; the country is naturally well adapted for breeding purposes; you only want the system. Don't despair, a patient perseverance will overcome all difficulties. Let us all, then, this evening, enter into the subject in good earnest, determined to sift the matter thoroughly, and to profit by the investigation. He went on to notice that the first great law of nature in breeding is, that like should produce like; if it was not for this law, which is constant and without exception, a mare might produce a calf, a sow produce a dog, a bitch produce a lamb, &c.; but it must be accompanied in our mind with another law, the law of variation. The child is not always like its parent in every respect, and sometimes not like its species, as when a lamb has two heads or six legs, &c., as we often find. Then we call it a monster. This diversity forms the problem of hereditary influence, and it is for the causes of, and reasons for, the variation that the breeder must enquire, and make himself acquainted with, so that he may, as far as possible, modify them. One of the causes of variation is what is called "breeding back." It is often a source of disappointment to the breeder that when he puts a well-formed female and a well-formed male, he gets an ill-formed colt or calf, and of quite a different colour to what he expected. If you enquire into the pedigree of the parents you will find the child answering in every respect to the description of an ancestor. This is the law of atavism. It is this that makes many say that horse-breeding is a lottery. However, if you breed properly you have little to fear. Pure and thorough-bred animals comparatively seldom breed back, or disappoint their owners in doing so. By thorough-bred is meant those whose ancestors were for a long time of the same shape, and adapted for the same purpose as themselves. The more the animals have been crossed the more subject are they to breed back, and more the difference in shape in crossing the more likely is breeding back to prove a disappointment. A case was related to illustrate this law. How is it to be explained? The "Westminster Review" very properly says, "It is to be explained on the supposition that the qualities were transmitted from the grandfather to the father (the other sex may convey it equally well,) in whom they remain latent or were marked by the presence of some antagonistic or controlling influence, and thence transmitted to the son, in whom the antagonistic influence being withdrawn they manifest themselves. Mr. Singer, let us say, has a remarkable aptitude for music, but the influence of Mrs. Singer is such that the children, inheriting her imperfect ear, manifest no musical talent whatever. These children, however, have inherited the disposition of their father in spite of its non-manifestation; and if, when they transmit what in them is latent, the influence of their wives is favourable, the grand-children may turn out musically gifted. In the same way consumption or insanity and other hereditary diseases seem to lie dormant for a generation or more, and in the next flashes out with the same fury as of old." This should make you very careful in breeding stock, and to ascertain that not only the sire and dam are free from spavin, curbs, &c., but that their ancestors were not subject to any hereditary affection, and not only that they were free from hereditary evils, but that they possess the same good qualities, and are adapted for the same purpose as themselves. Several very beautiful, instructive, and interesting illustrations were produced to prove that diseases arising from accident, as well as constitutional idiosyncracy, curious tricks, acquired habits, vicious and peevish tempers, as well as good tempers, &c., were hereditary, or transmissible from parent to offspring. Now comes the vexed question, "Which has the predominating influence on the progeny, the male or the female parent? If both parents join to form the child, does the parent give one group of organs and the other parent another group; or do both give all?" This subject is so very interesting, and it is so important, that the breeder should come to some definite conclusion upon it, that he felt justified in occupying a considerable part of their time in its investigation. Several great men were mentioned who maintain that the male parent furnishes the external configuration, or, in other words, the locomotive organs; while the female parent gives the internal or vital organs, each absolutely independent of the other. Other equally celebrated observers declare that it is quite the reverse, the female preponderates always in the locomotive organs, and the male in the vital organs. Others again, equally as eminent, assert that both theories are wrong; that the male always gives external configuration or locomotive organs, and the female the internal or vital organs, but do not mean it to be inferred that either parent gives either set of organs uninfluenced by the other parent, but merely that the leading characteristics and qualities of both sets of qualities are due to the male on the one side and to the female on the other, the opposite parent modifying them only. He (Mr. Evans) believed they were all wrong—that the truth lies between them. He related many very beautiful and interesting facts in support of each theory, which seemed conclusive in themselves; but he maintained it was not fair to look at one set of facts alone, and shut our eyes to others. It was by an impartial survey of them all that we get the truth. There was an able article upon this subject in the *Westminster Review*, with which he fully agreed, which says, "That both parents are always represented in the offspring; and although the male influence is sometimes seen to predominate in one direction, and the female influence in another, yet this direction is by no means constant, is often reversed, and admits of no absolute reduction to a known formula. We cannot say absolutely, the male give such organs; we cannot even say the male always predominates in such or such a direction. Both give all organs. Sometimes one predominates, sometimes the other. In one family we see children resembling the father, children resembling the mother, and children resembling both." He (Mr. Evans) knew many breeders who had suffered great disappointments and losses by practising upon the theory that the female does not give the external configuration, nor has any part in the locomotive organs. One of the greatest curses in horse-breeding is that there are but few good brood mares kept. He had no hesitation in saying that, as a general rule, and the only safe one to go by, the female has as much influence on the configuration of the progeny as the male has. The successful breeder never uses a middling female to breed from, trusting to the excellency of the male to make amends. If he has not a good female he will not attempt to breed. Seeing, then, that there is a diversity, that sometimes the influence of the male parent predominates, and sometimes the females, in each system of organs, let us inquire into the causes. Several illustrations were brought forward to prove that it depended upon potency of race, upon the vigour, health, and age of the parents at the time of copulation. The most potent or vigorous parent will have the greatest influence upon the offspring. The lecturer said, I shall now pass on to notice more particularly the practical application of these laws. It is a common but silly question, "Which breed of animals is the best for the farmer?" Some advocate short-horns, others advocate the long-horns, others the medium-horns, and others will have no horns at all. A particular kind is sometimes advocated under all circumstances to the exclusion of all others. Such persons remind me of those disputants about the true colour of the chamelion; all are right, and all are wrong, depending upon the point from which the object is examined. That breed of animals is the most profitable which is best adapted to that particular locality. One class does better on upland, others on lowland; some do better grassing, others do better housed. It also depends upon the demand of the neighbouring markets. In some parts cheese-making pays best; in other parts milk; in other parts meat, &c. In some districts it pays better to breed draught horses, in others hackneys and hunters, in others race-horses, in others ponies, &c. What I wish to impress deeply upon your mind is this: Every breed has its own peculiar conformation, and that conformation you will find, upon close investigation, to be peculiarly well adapted for a particular purpose; and when you adopt and cultivate a certain breed, you must always keep that purpose and that conformation steadily in view. If you lose the conformation, you will soon lose the purpose. For instance, we may divide cattle into two primary classes: 1, For fattening and arriving at early maturity; 2, For dairy purposes. For illustration, take two cows, one from each class, and you will find their shape or conformation diametrically opposed. Go to any herd you please, and you will find that just in proportion as the animals represent the shape of class 1 so are they disposed to fatten; and in the proportion they represent class 2 are they fit for dairy purposes. These classes may again each be divided into different divisions: A is better adapted for high land; B is better adapted to low land; C is better adapted for out-door living; D is better ter adapted for living in-doors, and so on. Each division has its own distinct peculiarity of external conformation. That enables us to say at once which will do here, and which will do there. It is all-important that the breeder should be thoroughly acquainted with these "points," or proper shape of his stock; but I should depart from my subject if I discussed them this evening. However, I know many farmers who think that there is only one proper shape for the horse—draught horses, hackneys, hunters, racers, all should be the same outline. They take the hunter as a standard of comparison, and the only proper difference they allow between him and others is not in the shape, but in the weight and bulk of bone and muscle within the same height and length. The race-horse should be more slender and finer, and the cart-horse stouter and more hairy. As I know that such a notion exists, you will permit me to say a few words, to show its absurdity. It is surprising how few farmers know the proper points of a horse; and many of the "knowing ones," in fact, know less than nothing. In that excellent journal, the *Farmers' Magazine*, for October, 1836, there is an article upon the cart-horse, advocating the same oblique shoulder, for the draught and for the hackney-horse, which is certainly a most ignorantly absurd and grossly fallacious doctrine. We may also divide horses into two primary classes: to carry weights on their back, and go fast; and to draw weights after them. It is evident that they are destined for very different purposes, and must set to work in a very different manner. The first-class has to carry the rider safe at a fast rate. For this purpose the fore-legs ought to reach over much ground when in motion, and the saddle should be so set that it will not interfere with the motion of the shoulders; and the weight should be so carried that it will not balance over the fore-legs, and make him tumble forward. The chief points to attain this are, that the withers and fore-hand should be high and thin. The shoulders should have much obliquity from the top to the point, and a line drawn vertically from this point should drop at the toe when the animal stands in his natural position. The second-class has to pull heavy weights at a slow rate, therefore, its shape should be quite the contrary to the first-class. The animal should be able to throw its whole weight into the collar, and to overbalance its centre of gravity, so that it has to step forward to avoid coming down. When the hackney or saddle-horse is in the collar he cannot pull a weight beyond the power of its hind-quarters. The shape of its fore-quarters rather prevents than help him to pull; while the draught-horse, by the peculiar shape of his fore-parts, is able to throw his whole weight into the collar to assist the muscles of the hinder-parts. It is common with waggoners, when a horse is not able to pull or start a load, to jump on his neck or withers, and by the weight overbalancing him, the load starts easily. The proper shape of the draught-horse, in contradistinction to the saddle-horse, then, should be a low and thick fore-hand and withers. The shoulder should be *comparatively* upright, and consequently the line drawn vertically from the point of the shoulder will fall considerably in front of the toe. The draught-horse should, as the saying is, "stand over his legs," and you now see that what is an excellent point in one horse is the worst that can be for another. Class 1 may be divided into—A, the race-horse for galloping; B, hunters, for galloping across country, and jumping, &c.; C, hackneys, for trotting and cantering on the road. Class 2 may also be divided into—A, the town dray-horse; B, the farm draught-horse, (both pull heavy weights and go comparatively slow;) C, the carriage-horse, (he goes on the road, pulls heavy weight, and must go fast, therefore in many respects his shape should approach the saddle-horse.) I have already said that I should be out of place in dwelling upon the proper shape of animals—it would form a subject for an interesting lecture of itself. I now merely draw your attention to the fact that there is a peculiar shape adapted to perform any particular work, and it is essential that the young man should make himself thoroughly acquainted with those before he can expect to be a successful breeder. Starting, then, upon the great law of nature, that like produces like, and being prepared to guard against variations by breeding from animals of the same sort, &c., breeding good stock becomes a simple matter of course. First ascertain what animals your land is best adapted for. Secondly, what have the readiest sale in your markets. Thirdly, having decided upon the purpose of your animal, study the best shape and conformation calculated to attain your object in a most perfect manner; if you wish to breed fat stock, study the shape most disposed to lay on fat with the least food, and to arrive at early maturity; if you wish to breed milk cows, study the proper shapes for them; if you breed horses, study the proper shape to perform their various duties. Fourthly, don't breed from an animal, whether male or female, whose shape is not well-adapted to perform the work it is intended for: let them be of the most perfect shape you can get of their kind. Fifthly, being acquainted with the law of attavism, or breeding back, you will not be satisfied unless their ancestors were also of the same sort, and equally good; in fact, thorough-bred, and free from hereditary evils. Remember that I do not confine the term thorough-bred to the race-horse. It may be equally well applied to the cart-horse, or hunter, or pony, or carriage-horse, &c. It means those whose pedigrees for a considerable time back were of the same class, and adapted for the same purpose as themselves. Unless you commence to establish a new breed you should never breed from a half-bred animal. Let them all be castrated, and treat all such mares and geldings. There is two much risk connected with it; it is based upon a wrong principle; you should carry the right principle out thoroughly. Why should you breed from a half-bred mare more than from a half-bred cow? I know many excellent horses bred from half-bred mares, but there are many more failures. Some of you may say that you have no pure or thorough breeds except racers; therefore, you ask how can you avoid crossing. Well, "it is never too late to mend." Suppose Messrs. Bakewell, Adney, Smith, and other eminent breeders, had listened to such an excuse? We never should have had the improved Leicester sheep, nor the improved Shropshire down. Though you may not have good distinct breeds of coach-horses, hackneys, &c., now, you may soon have by following the directions I lay down. Unless breeders will reform, that useful animal the hackney will soon become extinct. The present system of breeding hunters and coach-horses is a bad one; because by putting a race-horse to a half-bred mare you may get a good hunter, and you often fail; you may get a hack, you may get a useless one. By putting a hunting-horse to a Cleveland mare, you may get a carriage-horse, or you may often get one good-for-nothing. You have no law to depend upon. By breeding exclusively from animals of the same shape, and, therefore, adapted for the same purpose with careful attention to pedigree, you may easily establish a breed for any purpose whatever. At first, when originating the breed of hunters and carriage horses, of course we cannot avoid using crosses or half-bred animals, and such was the origin of the race-horse. They will soon bear the name thorough; and when, in after generations, a progeny will show the original cross, by breeding back, it must not on any account be used for breeding purposes. I should recommend you to breed from your own stock exclusively, only as long as you cannot find a better male than your own, and your stock improves. I do not object to a cautious admixture of blood, but you must not cross the breed. I do not object crossing two families, but those families must be of the same breed. That word "breed" is very comprehensive, and has many different meanings. By those of the same breed I wish it to be understood those of the same shape and adapted for the same work, with good pedigree. They may or may not be related. For example, you must not breed between a thorough-bred draught-horse and a thorough-bred hunter or racer. You would get a good-for-nothing mongrel, too weak for draught, too ugly for harness, and not the shape for saddle; yet our fairs are overstocked with such animals, which prove that the present system of breeding is a wrong one. I can countenance no crossing of the breeds. Keep them distinct. Have thorough-bred draught-horses, thorough-bred hackneys, thorough-bred hunters, as well as thorough-bred racers. Each has its own peculiar shape, suitable for its particular purpose. Why should they be mixed? As to the qualities of the brood-mare, there are some peculiarities essential for all breeds. She must be what is called roomy, allowing sufficient space to carry a foal, and for its passage into the world. For this purpose the carcase should be long, and the back ribs deep, the pelvis or hips should be wide and deep. The forehand is usually lower in the mare than in horses of the same kind. This, as Stonehenge observes, "gives the whole framework of the trunk a larger proportion than is always desirable in the race-horse, which may easily be over-topped; and here many good runners have failed as brood-mares, whilst a good number of bad runners have been dams of good race-horses. Beyond this roomy frame necessary as the eggshell of the foal, the mare only requires such a shape and make as is well adapted for the peculiar purpose she is intended for. It is better to breed from animals of a medium size of their kind, whether male or female, not too big, nor too small." To ensure the mare being stinted she should be perfectly healthy, and living as much as possible in a state of nature; not overfed with corn, but rather have cooling diet, unless she is poor. Fattened animals often prove barren. The best time for covering is when the heat commences. If convenient it is often recommended to do so a second time when the heat passes off. "Like the brood-mare," says Stonehenge, "the stallion requires several essentials, commencing also, like her, 1st with his blood; 2ndly, his individual shape; 3rdly, his health; 4thly, his temper. But there is this difficulty in selecting the stallion, that he must not only be suitable, but he must also be adapted to the particular mare which he is to serve. Thus it will be manifest that the task is more difficult than the fixing upon a brood-mare, because (leaving out of consideration all other points but blood) in the case a mare only has to be chosen, which is of good blood, for her particular work; while in the other there must be the same attention paid to this particular, and also to the stallion's suitability to the mare, or to "hit" with her blood. The rock upon which most men split is a bigoted favouritism for some particular horse; thus one puts all his mares to Birkenhead, another to Hunting Horn, although they may every one be of different blood and form. Now this cannot possibly be right, if there is any principle whatever in breeding; and however good a horse may be, he cannot be suited to all mares. Some say that any sound thorough-bred horse will do for a thorough-bred mare of the same kind, and that all is a lottery; but I hope you now perceive that there is some science required to enable the breeder to draw many prizes. That the system generally followed of late is a bad one, I am satisfied, and with the usual and constant crossing and recrossing it is almost a lottery; but upon proper principles and careful management, there would be fewer blanks than at present. We cannot expect to find a perfect mare nor a perfect horse; there is some "if this," or "but that" in all them. The breeder, however, must be particularly careful that both should not be faulty in the same place —that both should not have the same objection—and whereon one is deficient the other must be unusually developed. In thus matching his mares the judgment of the breeder is proved, that they may "hit" well. The same rule of course applies to all animals. Mr. Bell well observes, that "the importance of the influence of the sire in breeding horses is in no point more clearly proved than by the fact that the progeny of the most celebrated race-horses have generally sustained the reputation of their sires. Thus the descendants of Eclipse numbered no less than 364 winners, and those of Matchem, Highflyer, and other celebrated horses have partaken of the same inherited excellence. Sultan, the property of the Duke of Beaufort, which covered at £30 a mare after he was 20 years old, Snap of the House, General, and Admiral of Ludlow, and not forgetting Sir Sampson, were celebrated stallions in this country 20 and 30 years ago; and though they are long since dead, yet they now live, and are well known in their descendants. It is a remarkable fact that the first male put to a female, especially if he be potent, influences more or less the progeny of that female by subsequent males. A striking case of this kind was first published in the *Philosophical Transactions*. A splendid mare, seven-eighths Arab, had a mule by a quagga, in the year 1816, the mule bearing the unmistakable marks and stripes of the quagga. In the year 1817, 1818, and 1823, this mare again foaled, and although she had not seen the quagga since 1816, her three foals were all marked with the curious quagga marks. Nor is this by any means an isolated case. Meckel observed similar results in the crossing of a wild boar with a domestic sow. Mr. Orton verified this fact in the case of dogs, and poultry. Mr. Merrick, in the *Veterinarian*, records the experience of his groom, who has had the management of stallions for 14 years, "that he has frequently noticed that well-bred mares, which had been difficult to stint with thorough-bred horses, have bred to an inferior, and subsequently to a thorough-bred stallion; but her stock by the latter has frequently showed traces of inferior blood, not to have been expected from the breed of either the sire or dam. You will, therefore, bear in mind that it is especially important that the first male given to a female should be well bred. I know that there is a foolish notion with some people about dogs, that the first litter is not likely to be good, therefore they allow the bitch for the first time to go about with any and every dog, little thinking the bad effect such treatment has upon future litters. In explanation of this phenomenon that eminent physiologist, Professor Carpenter, in his celebrated work upon "Human Physiology," writes: "Some of these cases appear referrable to the strong mental impressions left by the first male parent upon the female; but there are others which seem to render it more likely that the blood of the female has imbibed from that of the fœtus, through the placental circulation, some of the attributes which the latter has derived from its male parent; and that the female may communicate these, with those proper to herself, to the subsequent offspring of a different male parentage." The same author also writes: "There seems good reason to believe that the attributes of the germ are in great degree dependent not merely upon the habitual condition of the parents, which have furnished its original components, but even upon the condition in which those parents may be at time of sexual congress. Of this we have a remarkable proof in the phenomenon well known to breeders of horses, that a strong mental impression, made upon the female by a particular male, will give the offspring a resemblance to him, even though she had no sexual intercourse with him. In conclusion, allow me to say that agricultural societies are to be blamed very much for the little attention they pay to horses as compared with other stock, especially poultry. They ought to give liberal prizes to the brood mares and stallions of all breeds, and pay as much attention to them—they deserve more—as to cattle, &c. The best stallion should have to travel within the district of the society during next season, and not to receive the prize until the end of that time. I must add that our great landlords generally overlook the interest of their tenants, and consequently their own also, in not keeping good thorough-bred stallions, of different breeds, for the use of their tenants at a nominal charge. Farmers themselves also overlook their own interest too often by being "penny wise and pound foolish," in looking more at the fee of the horse, when they engage him, than at his shape.

Examine your pickles, sweet-meats, and everything put away.

Treatment of Peach Trees.

R. Seamans, of Cecilton, Maryland, thus gives his plan of treatment of peach trees, which he cultivates on a large scale:

"They should be carefully examined every year, and all the worms and *ova* destroyed. A shovelful of wood ashes thrown around the roots every spring is beneficial. When six years old, the soil should be cautiously removed for about two feet round the trunk, so as to examine the root. A strong wash of lime and some salt should then be applied to the top of the root at the trunk and for about eighteen inches above it, prior to which application the rough bark should be scraped off. The removed soil is left open for one week, then placed in its former position. A yearly examination for worms, a rich soil, and careful cultivation, are all necessary for the prosperity of the peach tree.

Extirpating Thistles from Grass Land.

To me there have appeared few things more extraordinary in the history of farming knowledge than the perverse tenacity with which prejudice has so long preferred the scythe to the roller in keeping down thistles. In the North Riding of Yorkshire, as far back as forty years ago, the roller was an approved instrument for destroying thistles in pasture grounds: and most effective it proved to be—the bruise and crush of the top of the plant extending in mortification to the root. No doubt of it, the scythe makes a clean sweep—so does a surgeon when he cuts a leg off; but let a crushed leg remain attached to the body, and the undertaker will assuredly have employment.

Pitch Phenomenon at Sea.

While the bark *Rolla*, of New York, was in the Gulf of Mexico, on May 4th, it passed through a scum of smoking pitch, which extended for several miles, and emitted a most nauseating odour. It was supposed by her captain (Mr. Rogers) to be thrown up by a submarine eruption from some part of the bottom of the ocean. This, we think, is the true explanation of the phenomenon. There are extensive formations of mineral pitch in Cuba, Trinidad, and other West India islands, and no doubt there are beds of this material under the waters of the gulf.—*Scientific American.*

Reclaiming Clay Soils.

No subject can be more important to large districts of our country, than the reclaiming of clayey and other heavy soils. Among these we may name the red-kellis hard pan soils, ferruginous clays, ferruginous loams, etc. As to the first, in common with some of the others, we will not be disputed in the assertion, that when clayey or heavy soils are properly reclaimed, they are more valuable than lighter soils. The fact that they retain manures, requiring less in amount to raise crops, is alone a strong argument in their favor. Their ability to repeat a greater number of crops without exhaustion, and their general adaptability to all crops instead of being suited only to special crops, add materially to their value.

Clay soils are always more fully charged with the inorganic constituents of plants than light soils; and when once in the proper mechanical condition to avail of atmospheric influences, insuring higher temperature and consequent chemical action to liberate phosphates, alkalies, etc., they form the most profitable farms. One of the peculiar properties of clay is to receive and retain ammonia, even against the effort of running water to remove it; the formation of new chemical compounds with the divided silicious matters pervading it in degree, as each grain surrounded by alumina presents all its surface upon the slightest contraction of the clay by drainage. No clay soil is entirely without sand, and in such soils the land may be viewed as *miniature rocks*, generally of diversified kinds, containing all the primaries of nature; while in sandy soils the particles all arising from the same or similar rocks, do not supply so great a variety of pabulum for plants. Most clays, therefore, when in admixture with the other materials which go to make up a soil, have a greater variety of constituents, are in better condition for improvement than other soils. Their compact condition requires amendment, however, before their advantages can be availed of.

First—Under-drain them thoroughly; the redundant water being parted with, the clay contracts and a series of pipe-like openings first occur; these permit a more thorough circulation of atmosphere, which in turn divides these pipes into lesser portions, like broken and partially ground tobacco pipes; the adhesive property of the clay is now lessened, and sub-soil plowing ameliorates it materially. Fall plowing by ridging and back furrowing, leaving the surface like a succession of inverted letter V's, permits the freezings and thawings of winter to ameliorate still further their condition; these ridges split in the spring by a double mould-board plow, and then cross-plowed, give a kindly soil, capable of being used even for garden purposes. The day has passed when farmers suppose that clay soils retain manures because they will not pass water. They now know that water heavily ladened with any matters in solution, if filtered through sand containing only one per cent. of *clay*, will be rendered pure, the clay retaining all the matters before held in solution. They also know that all the gases are received and retained by clays; and, therefore, manures decomposing in clay soils can neither filter downward in solution, or rise into the atmosphere as gases, and for these reasons the clay soils retain manures. If clay has such properties, it has always had them, and during all time clayey soils have been storing up Nature's treasures; put them in proper mechanical condition to permit roots and atmosphere to percolate them, and they will furnish food to plants.

All the above remarks apply to all the kinds of soil named in the opening of this article. If deleterious matters are contained in them, as in the copperas clays, the admission of atmosphere renders these foreign substances the more soluble, and while the clay retains all matters required by plants, it freely parts with such solutions as are unfriendly to vegetation. The red-kellis subsoils fall to pieces as soon as under-drained and sub-soiled plowed, and in doing so yield up potash in abundance.

We dug a well sixty feet deep seven years ago through this red kellis, blasting all the way, and the kellis seeming to be solid sand-stone. When exposed to the atmosphere for a few months, it fell to pieces and made a soil worthy of being used as a manure on many other soils.—*Working Farmer.*

Deep Plowing--When to do it.

I am a practical advocate of deep plowing, having been engaged for several years past in deepening my farm, and having found it more profitahle to add to my land in this way than by buying more acres. My deed runs down to the centre of the earth, and I mean to make the most of it, and I have found that this also gives me another advantage, for the deeper I get my farm, the higher my grain grows, so I gain in both directions, and by this means I reckon I've got at least thirty per cent. more available space than formerly; at any rate my seventy dollars per acre land would now bring me ninety dollars—but I hav'nt got to the bottom nor top of it yet, and I mean to stick to it.

I have found by experiment that it is best to run the plow deeper when raising oats and winter grain, rather than when breaking up for corn.

Corn is an aristocratic plant as you might know by its tasseled head, silk gloves, and long ears, and like such gentry it must have good nursing in the beginning, and the best living the land will afford. It sends its roots about, near the surface where it can find plenty of food, and where they can grow comfortably near the warm surface. If you plow deep enough to turn up the cold and hard subsoil, the seed planted at the usual depth will germinate where they meet with a cold reception, especially if the season be wet. Scarce any crop seems to be more benefitted by an early start, or to be more injured by a slow, painful growth in in the commencement. The young plants seem to be discouraged, and not having force enough to dig down to find a good living, they are apt to grow up sickly.

In cultivating this crop I have, therefore, practised turning up all the soil, gaging my plow to run just on the subsoil, and let the corn have the full benefit of the manure and clover which were plowed under. The crop is followed with oats, which can stand a cold and wet soil better. Then I drive the plow deeper, about an inch, as you recommended in your last number. The soil, mellowed by the previous hoed crops, gives the oats a good chance, and they bear the subsoil mixture on the top quite well. The following crop with me is rye and seeded down with clover and timothy, especially the former. Now I give the gage another turn, and bring up say another inch of subsoil, and the rye and the clover dig for their living—and mine—most admirably.

Rotation and Deep Soil—A Corn Experiment.

Regular rotation of crops and deep plowing are working wonders upon some of the old and long-worn farms of New England In the discussions before the Maine State Board of Agriculture, which met at the seat of government in January, many of the delegates bore striking and uniform testimony to the value of both these practices, especially upon lands that had been cropped hard. One of the members mentioned a field of fifteen acres, "badly bound out," which was plowed three inches deeper than ever before, and after an application of three bushels of plaster of Paris, produced a yield of 600 bushels of oats. This is forty bushels to the acre. Another reported a yield 82 bushels shelled corn per acre—56 lbs., to the bushel, from a field similarly treated.

Results very much like these could be obtained from many of the old fields in Kentucky, which now grow nothing but sedge and briars, if deeply plowed, and the application of plaster were substituted by a generous quantity of barn-yard manure or a compost of which the base should be stable dung and scrapings from the woods.

We have our mind's eye now upon an old field twelve miles from Louisville, which was treated in this manner three years ago, and gave a yield of corn in return that much more than paid expenses. Without further preparation it was seeded to grass, sown upon the corn stubble, and will this season be more than fair pasture or meadow, for one or the other of which it is designed. The corn in this experiment was manured in the hill.

Our farmers complain of the great labor and heavy cost of such experiments. But such complaints are without reason. Every farmer who keeps merely two or three horses, four or five cattle, a half dozen hogs, if he will only litter his stalls, pens and barn-yard, with the cheap litter afforded by the woods a short distance from his dwelling-house, in quantities enough to furnish his animals with comfortable bedding, he can have every year, by planting time in the spring, a mountain of compost such as we have described that will perfectly astonish his own eyes.

So much for the cost of that part of the experiment. It really costs nothing, for it will pay for itself in the increased comfort supplied to his stock, and the diminished quantity of food necessary to carry them through the winter. As for the labor and expense of hauling out, that is not very formidable, when you post up and look the thing right in the face.

In the instance to which we have referred, after the field was checked off for the seed, a two-horse wagon and three men manured four acres per day—giving to each hill a large shovel full of the compost. The actual expense in this case was probably two dollars per day, but in any case would not be over four dollars, or one dollar per acre. Without the manure, the old field might possibly have yielded 25 bushels to the acre; with it, it yielded about 40 bushels. Difference, 15 bushels, which, only at 33⅓ cents per bushel, is $5.

All this is clear gain, for the cost of hauling out and applying the manure is fully repaid by the condition in which the crop left the ground for grass.

After this field has lain in grass two or three years, it will probably be turned over for another trial, and we will then speak of it again.—*Louisville Journal.*

Subsoil Plowing.

Before commencing spring work it will be well to consider which lands should, and which should not be subsoiled.

From the days of Jethro Tull until within the last twenty-five or thirty years, the farmers of England were content, in common with those of other countries, to stir the immediate surface of the soil, and were not aware that a greater depth of disturbance would produce a larger and better result. Indeed, it was generally believed that the whole matter which went to fertilize plants, belonged to the immediate surface, or that portion known as *loam*—a name given, until very recently, to the disturbed portion only—which, by the combined influences of the sun, air, and decay of vegetation, changes its color. The fact that the components of the soil beneath these points were all to be found as part of the integrants of plants was scarcely known, and still less so that they could not be absorbed by them, and thus go to make up the structure, until acted on by a series of influences caused by atmospheric contact and the presence of humidity; not the result of stagnant water. Liebig first exposed the true value of the inorganic substances of the soil, or those parts which were not the immediate result of plant decay; and farmers slowly yielded their long cherished belief that the black portions of the soil alone could make plants. These new doctrines gave rise to the use of a subsoil plow, which, without elevating the subsoil to the surface, disturbed it in places, and permitted a free circulation of atmosphere between its particles. The deep cuts made by the plow also acted in degree as underdrains, and permitted, under some special conditions of surface—such as the slope of hills, etc.—redundant water to pass way. Air necessarily entered, and chemical changes occurred; the surface of the particles of the subsoil were soon conditioned so as to sustain roots, and they passed into it to a greater depth than had been before known. These, in turn, absorbed from the subsoil larger quantities of inorganic matter, rendered soluble by chemical changes consequent upon moisture and air. The constituents were taken into the plants above, and portions not marketable as crops, decay in the upper soil, adding to the greasy, unctuous, organic matter new portions of inorganic food for future crops. Plants had longer roots as well as greater number of fibres, and larger crops was the consequence. The decay of these roots in the soil left tubes to great depths; the atmosphere could come in laden with gases, resulting from vegetable decomposition required by plants; rains and dews, which was the nitrogenous exhalations of all organic nature from the atmosphere, descended into the subsoils, which gradually changed color so as to make deep loamy soils in localities where before only sparse, shallow-rooted crops could be grown. All this was heard of by the American farmer long before he was awakened to action; and even now, when every truly practical farmer owns a subsoil plow, he can tell you of some neighbor who cautioned him against its use, and who insisted that the deep disturbance of his soil would let all the manure filter downward; that, if that were true, every well would be the receptacle of the results of decay, every spring would be a cesspool, and every rivulet but an organic charnel-house. Nature, in the wisdom of her laws, has rendered the carbon and alumina of the soil, after proper exposure to atmospheric influences, capable of receiving and retailing all the results of decay; and the value of a farm must depend upon the depth to which its surface by disturbance is rendered capable of performing this peculiar function.

Thoroughly subsoil-plowed lands soon become capable of deeper surface plowing, without injuring the crops; and if underdrained, which is but the perfection of the very principles presented in the theory of subsoil plowing, then all the mechanical conditions necessary for maximum results are secured. And when these exist, the chemical conditions follow as a natural consequence.

Among the advantages arising from subsoil plowing may be enumerated the following: The value of land for agricultural purposes is doubled; the relative amount of manure required, as compared with the amount of produce, lessened; the farm is essentially protected from the effects of drought; all future labor of the farm is materially lessened, and thus the expenses of teams, the wear and tear of agricultural implements, are all decreased, while the quality of crops, and their quantity, are so augmented that, per bushel or per pound, they take a preference in every market.

It has been said, and probably with truth, that if the subsoil plows and underdrains of England had not been introduced up to this time, the area of land under cultivation could not have sustained her population. Fifteen years ago there was not in the State of ——, as many subsoil plows as there are now foundries for casting them; and when a friend of the writer first introduced the subsoil plow he had not a neighbor who had seen one. We suppose this may be said of farmers in every county in the United States within the last twenty-five years.

Harper's Weekly.

A Hole in the Pocket.

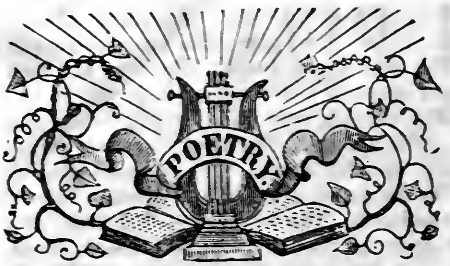
A great many men have a hole in the pocket, and so loose all the little change they put in And the worst of it is they do not know it—if they did, they could mend up the hole and so put an end to the loss. Every day they are minus a few dimes, and they wonder how they come so short. When bills are to be paid they cannot imagine how they came to be so short of change. At the end of the year they are surprised to find so poor a footing up. They work hard, rack their brains on plans, and still they do not get ahead much. Bills accmulate, income diminishes, and still they do not discover the hole in the pocket.

One man has bad fences, gates and bars. The cattle break through every now and then and destroy crops, and occupy time in driving them out. The pigs creep through the holes. The geese find many entrances. The horses get away. The boys and men and servants and dogs are kept on the run after rougish cows and jumping horses and climbing hogs. The stock becomes uneasy and does not thrive. The crops are injured. The fences are often broken down. Time is consumed. The trouble is—that man has a hole in the pocket. One man has no sheds, nor barns, nor grainries, nor tool-houses. His hay and grain he stacks. His vegetable he buries. The rain spoils much of his hay. His grain is much injúred and wasted. The rats eat his corn; and the damp weather moulds it. His potatoes rot. His pumpkins are destroyed. His apples do him but little good. His tools are rotted and rusted in the open weather. His stock is chilled and stunted for want of shelter. His trouble is a hole in his pocket, out of which slips all his profits, much of the fruits of his hard labor.

One man has poor plows of the senile stamp of his ancestors. He only skins the land with it. He can't afford a modern plow. He don't believe in sub-soiling. Draining is the nonsense of scientific fools. Drills are a humbug. Deep plowing would spoil the land. So he plows and sows as his grandfather did, on the worn-out soil of his venerable ancestor. He has a hole in his pocket, and will have till he takes up to the importance of good tools and good culture of himself and soil.

One man don't take a paper; can't afford it; has no time to read; don't believe in book-farming; likes the old ways best; denies all the stories he has heard from rumor, about large cattle and crops and profits; doesn't believe in new notions. For forty years he has planted his corn on the same ground; sown wheat in the same field; pastured the same land and mowed the same meadows. He has heard of "rotation of crops," but doesn't know what it means nor cares to know. A bad hole has this man in his pocket.

And who hasn't got a hole in his pocket? Reader, haven't you? Look and see. Is there not some way in which you let slip the dimes you might better save; some way in which you waste time and strength and mind? If so, then you have a hole in your pocket. Indeed, many a man's pocket is like a seive. Whose pocket is a treasury, safe and sure?—*Valley Farmer.*



The Blind Boy.

An editor, from whose selections we take the following lines, has beautifully said, that for himself he could not see to read them through.

It was a blessed summer's day:
  The flowers bloomed, the air was mild,
The birds poured forth their tender lay,
  And everything in nature smiled.

In pleasant thought I wandered on.
  Beneath the deep wood's simple shade;
Till, suddenly, I came upon
  Two children who had there to strayed.

Just at an aged beech-tree's foot,
  A little boy and girl reclined;
His hand in hers he gently put—
  And then I saw the child was blind.

The chidren knew not I was near—
  The tree concealed me from their view—
But all they said I well could hear,
  And could see all that they might do.

"Dear Mary," said the poor blind boy,
  "That little bird sings very long;
Say do you see him in his joy,
  And is he pretty as his song?"

"Yes, Willie, yes, replied the maid,
  "I see the bird in yonder tree,"
The poor boy sighed and gently said,
  "Sister, I wish that I could see!"

"The flowers, you say, are very fair,
  And bright green leaves are on the trees,
And pretty birds are singing there,
  How beautiful to one who sees!

"Yet, I the fragrant flowers can smell,
  And I can feel the green leaf's shade,
And I can hear the notes that swell
  From those dear birds that God has made.

"So, sister, God to me is kind;
  Though sight, alas, He has not given;
But tell me are there any blind
  Among the children up in heaven?"

"No, dearest Willie; there all see:
  But why ask me a thing so odd?"
"O, Mary, He's so good to me,
  I thought I'd like to LOOK at God."

Ere long, disease his hand had laid,
  On that dear boy so meek and mild,
His widowed mother wept and prayed
  That God might have her sightless child.

He felt her warm tears on his face,
  And said, "O, never weep for me,
I'm going to a bright, bright place,
  Where Mary says I God shall see.

"And you'll come there, dear Mary, too,
  But, mother dear, when you come there,
Tell Willie, mother, that 'tis you—
  You know I never saw you here!"

He spoke no more, but sweetly smiled,
  Until the final blow was given;
When God took up the poor blind child,
  And opened first his eyes—in heaven.

Water Music.

'Twas in summer—glorious summer,
  Far beyond the smoky town,
Weary with a long day's ramble
Through the fern and blooming bramble,
  Needing rest, I sat me down.
Beetling crags hung high above me,
  Ever looking grandly rude;
Still there was some trace of mildness
In this scene so weird—its wildness
  Might be sought for solitude.

Birds and flowers, songs and beauty,
  Seemed this rugged realm to fill;
That which was my soul entrancing
Was the music and the glancing
  Of a rock born plashing rill.
Lingering there, I was delighted,
  Musing on the day gone by,
Watching its bright spray pearls sprinkled,
Every silvery tone that tinkled
  Touch'd some chord of memory.

'Twas as if sweet spirit voices
  Threw a spell around me there;
Now in lightest notes of gladness,
Now in deeper tones of sadness,
  Waiting, whispers to my ear.
Memory, hope, imagination,
  Seemed to have usurp'd my will;
And my thoughts kept on a dreaming
'Till the bright stars were a gleaming,
  To the music of the rill.

What a world of strange reflections
  Came upon me then unsought!
Strange that sounds should find responses—
Where e'en mystery ensconces—
  In the corridors of thought!
Then emotions were awakened,
  Making my heart wildly thrill,
As I lingered there and listened,
While the dew around me glistened
  To the music of the rill.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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London, or Central Farmers' Club.

THE PROGRESS OF AGRICULTURE.

The usual Monthly Meeting of the Members took place on Monday evening, April 4, at the Club-house, Blackfriars.

The subject for discussion—"The Progress of Agriculture," was introduced by Mr. R. Smith, of Emmett's Grange, South Moulton, Devon.

After a few introductory remarks from the Chairman, (Mr. Thomas, of Bletsoe,)

Mr. SMITH said: Gentlemen,—When we speak of "the progress of agriculture," I feel that every link in the chain of agricultural events forms a theme in itself, alike expressive of the progress which the "art," the "manufacture," and the "commerce" of agriculture have made during many past centuries, and down to the present time. Indeed, the subject grows upon me, when I reflect that our island was once a "common waste," and that the industry of man has redeemed it from century to century as population increased. Thus agriculture has been fostered from the earliest dates, and we live in a century in which the art has made a degree of progress hitherto unprecedented. * * * * The progress of British agriculture has long been a leading subject in the history of our island, and has been dilated upon alike by the historian, the politician, and the poet. It is common ground for every citizen; it is a nation's question, involving the supply of food for an increasing population upon a given space of land—an island. Indeed, the first want of man is food, and his natural resource for it must be the ground. Hence the tillers of the soil share no small responsibility in the general weal of our national progress. Agriculture is the parent of manufactures and commerce; hence it is not only the most useful of arts, but that which requires the greatest number of operators. The early invention of tillage would be coeval with the discovery of the uses of the cereal grasses, and may thus be considered as the grand step in the invention of ancient husbandry, and the most important as leading to the establishment of property in territorial surface. The early practice of agriculture was confined to men of humble station, who pursued it as a matter of business for daily livelihood. In the last century the occupation became more extended, and it has been engaged in by men of rank and capital, together with some other amateur practitioners, as a matter of taste and recreation. It is both curious and interesting to refer to some early writers upon agricultural affairs, who, be it remembered, lived in the days of seclusion; but nevertheless they had their wits about them. In the time of the Romans, we find Cato recommending a farm and situation "where there are plenty of artificers and good water; which has a fortified town in its neighbourhood; is near to the sea, or a navigable river, or where the roads are easy and good." To these requisites Varro adds—"a proper market for buying and selling; security from thieves and robbers; and boundaries planted with useful hedgerow-trees." The arable land preferred by Columella is the "fat and free, as producing the greatest crops and requiring the least culture." Again: the occupation preferred by Cato is that of "pasture, meadow, and watered grass-land, as yielding produce at least expense." When speaking of plantations and buildings, Cato recommends men "to plant in their youth but not to build till somewhat advanced in years." Another author says—"Take care in the making of your buildings that they are equal to the farm, and the farm equal to the buildings." On the arrival of the Anglo-Saxons, this island, according to Fleury's history, abounded in numerous flocks and herds, which these conquerors seized and pastured for their own use. The rent of land in those times was established by law, and not by the owners of the land! Very little is known of the implements or operators of husbandry during that period. In the thirteenth and fourteenth centuries agriculture rallied to a considerable extent, and was carried on with vigour. Sir John Fortescue, in a work in praise of the English laws, mentions the progress that had been made in the enclosure of lands, the planting of hedges and hedge-row trees, before the end of the fourteenth century. During the greater part of the fifteenth century England was engaged in civil wars, and agriculture, as well as other arts, declined. Soon after the beginning of the sixteenth century agriculture partook of the general improvement which followed the art of printing, the revival of literature, and the more settled authority of Government. The first English treatise on husbandry now appeared, being written by Sir A. Fitzherbert; and it contains directions for draining, clearing, and enclosing a farm. Landlords are therein advised to grant leases to farmers who will surround their farms by hedges and improve the lands. We have then a short information "for a yonge gentylman that intends to thryve;" and a prologue for the wives' occupation. Among other things, the wife is to "make her husband and herself some clothes; and she may have the "lockes of the shepe, either to make blanketts and coverlettes, or both." Further, it is recorded that "it is the wives' occupation to wynowe all manner of cornes, to make malt, to go or ride to market, to sell all manner of cornes," and faithfully to bring back the money to her "lord and master." The seventeenth century is distinguished by some important improvements in agriculture, among which are the introdution of clovers and turnips in England. That the agriculture and general prosperity of this country have been greatly benefited by the Revolution of 1688, is an undisputed fact. But the general progress of agriculture in Britain, from the Revolution to the eighteenth century, was by no means so considerable as from the great exportation of corn we should be led to imagine. The gradual advance in the price of land-produce soon after the year 1760, occasioned by the increase of population, and of wealth derived from manufactures and commerce, gave a powerful stimulus to rural industry, augmented agricultural capital in a greater degree, and called forth a more skilful and enterprisng race of cultivators. A brief glance at a few of the early practices, before the eighteenth century, may be interesting, and possibly useful, as showing that, even in early times, many good principles were laid down by the husbandman of old. The modern rush for "things new" certainly creates a lively interest, and leads men on to enterprises that their forefathers thought not of; but have we not unfrequently estimated too lightly ancient practices, and especially those that relate to provincial warnings? Amongst the earliest subjects that claimed attention may be mentioned those of draining, irrigation, the effect of climate, the trying of experiments, and so on. With regard to draining, I find, on referring to some old authors, that in the time of the Romans, Cato gives directions for draining wet-bottomed sands: "To make drains four feet deep; to lay them with stones; and if these cannot be got, to lay them with willow rods." Columella directs "that the drains be deep, and narrow at the bottom." Pliny says that "flint or stones may be used to form the waterway, filling the excavation to within eighteen inches of the top." Of irrigation, Cato says, "as much as in your power, make water-meadows." Of climate, an early author writes: "Whoever would be perfect in this science, must be well acquainted with soils and plants; and must not be ignorant of the various climates, that so he may know what is agreeable, and what is repugnant, to each." Varro writes: "The ancient husbandmen, by making experiments, have established many maxims; their posterity, for the most part, imitate them." This saying is referred to by Pliny, who says that "there were sent to Augustus, by his factor, nearly 400 stalks, all from one grain; and to Nero 340 stalks." He says: "I have seen the soil of this field, which, when dry, the stoutest oxen cannot plough; after rain, I have seen it opened up by a share, drawn by a wretched ass on the one side and an old woman on the other." Among the leading features of practical agriculture during the eighteenth century, we may enumerate the gradual introduction of a better system of cropping, since the publication of "Tull's Husbandry," and other useful works from 1700 to 1750; the improvement of live-stock, by Bakewell and others, about 1760; the drill-system of growing turnips; the use of lime and marl in agriculture; the tapping of springs; the revival of the art of irrigation, by Boswell; and the publication of the Bath Agricultural Society's papers, in 1780. The introduction of the Swedish turnip, about 1790; and of spring wheat, about 1795; and the reports of the Board of Agriculture about this time, also contribute to increase the products of agriculture—as the enclosing of common fields, lands, and wastes, and the improvement of mosses and marshes contributed to the produce and salubrity of the general surface of the country. The progress of the taste for agriculture about this time is shown by the great number of agricultural societies that were formed; one or more as a beginning in almost every county. Amongst these the Bath and West of England Society, established in 1777, holds the first rank. We are indebted to this society for the "Bath Papers," of which sixteen volumes were printed; they were the first agricultural periodicals of England, and were the precursors of the "Journal of the Royal Agricultural Society." The establishment of the Board of Agriculture, in 1793, was looked forward to with considerable interest, and ought to have commenced a new era in the history of the agriculture and rural economy of England at that date; but the country was evidently not prepared for so bold and comprehensive an undertaking, and it consequently effected little beyond the publication of the "County Surveys;" still it may be said to have raised the "art of agriculture" amongst the higher classes. This brief, and yet I fear too lengthened, sketch of the early ages, brings us down to the 19th century. The more modern improvements date from this period; still it had been the early province of such men as Jethro Tull, Arthur Young, Marshall, Sir John Sinclair, Lord Somerville, the late Duke of Bedford, Mr. Coke, Sir Humphrey Davy, Bakewell, Loudon, Cully, Cline, Collins, Blakie, Parkinson, and others, to enlighten the path of agriculture before the nineteenth century. These and other good men, true patrons of the art, laid down principles which have rarely been excelled by the modern improver. A field of enterprise was now opened up, and "men of many grades" became interested in the more popular occupation of cultivating and enclosing the broad acres of our island, which had so long required this stimulus. The late Lord Leicester and the late Duke of Bedford did much towards making agriculture a popular pursuit. This was accomplished by their festive gatherings at the Holkham and Woburn meetings. These animated and dscriptive gatherings went far to enlighten the many visitors who assembled from distant counties. These, on returning home, propounded the advances that had been made, which ultimately resulted in the establishment of local societies for the exhibition of native produce, and the discussion of their future prospects. Then followed the suggestion that a National Society should be formed, for the collection and display of the English breeds of live-stock in a prepared state for the shambles of the metropolitan purveyors. The resources of our English breeds of fat stock had not hitherto been developed; and it was suggested that such a gathering of business men and breeders at a national exhibition in London must be productive of good, and gradually lead to the diffusion of improved ideas amongst the general body of breeders and agriculturists. Then followed the establishment of the Smithfield Club, in 1798—about sixty years ago. To show the early popularity of this new society, I may mention that in 1800, his Majesty George III. was an exhibitor. In 1806 the Duke of York gained a prize, and of late years the Prince Consort has obtained many prizes with Devon cattle. Experiments in the qualities of vegetable food were instituted, and an exhibition of rude implements now formed an adjunct to the Club's display of fat animals. To this successful institution, English agriculture has been mainly indebted. It promoted the gathering of influential men, breeders of live-stock and others, who were eminent for their literary attainments; the one finding practical matter, and the other diffusing it to an advancing class of men; for the sons of agriculture had made a start. It is to this institution that we stand indebted for the parentage of the Royal Agricultural Society. The enrolment of this Society was first mooted at the Smithfield Club Dinner, on the 11th of December, 1837. In this the late President of the Club (Earl Spencer), the late Henry Handley, the late William Shaw (Editor of the *Mark Lane Express*), and the present President, His Grace the Duke of Richmond, took the most prominent part. This society has now held its twentieth anniversary for the exhibition of our English breeds of live stock, has collected and tested thousands of implements, has published about forty journals of English agriculture; and not only has it collected information, but it has been the source from which practical and scientific knowledge has been disseminated by every channel, through the length and breadth of the English counties. From the formation of this justly national society, English agriculture derives its modern type. Before this period of our history, who ever heard of a steam threshing machine, a reaping machine, or a steam plough? How many parts of England had never seen specimens of our established herds and flocks? What breeders anticipated a foreign trade for their produce? Who had manured his lands with portable manures from a guano bag, the produce of foreign birds? Who had thought of reducing a hard, bony substance to a soluble food for the immediate use of the root crops? or, lastly, who had anticipated the publication of such an agricultural work as the Journal of this society? These are results, of which we as Englishmen have a right to be proud. But in the field of our progress we have had another hand-maid at work for us —I mean the press and agricultural literature of the present day. Such men as the late Philip Pusey, Wm. Shaw, Loudon, Sir John Sebright, Bayldon, Youatt, Young, Marshall, did good service in this department. Amongst the other names familiar to our ear are those of Professor Liebig, Way, Nesbit, Voelcker, Lawes, Gilbert, Thos. Dyke Acland, Thompson, Johnson, Morton, &c. In former ages but few books were written upon agricultural subjects. The first "Farmer's Journal" was published in 1808. This old and methodical paper, assisted by occasional agricultural pamphlets, formed the agricultural press and literature of the age. Such was the drug in the reading market, the distaste for new inroads, and the aversion to theorists, that this one journal had but a limited circulation. Moreover, owing to the state of the roads in those days, and the lack of post-office facilities, it is doubtful if the farmer always obtained the journal when he expected it. I will not enumerate the periodicals and newspapers which are now circulated amongst the agricultural community, except by way of illustration. I would ask who in this room would now relinquish his paper? Who, indeed, could keep pace with the progress of agriculture without the "Mark-lane Express," "Bell's Weekly Messenger," and other journals now directly devoted to the cause of agriculture? What member would now yield to the suppression of this club's monthly reports? On the contrary, are they not treasured up as records of passing events? These are gratifying results; but how have they been brought about? True it is that the Smithfield Club and the Royal Agricultural Society have been mainly instrumental in the development of the art of agriculture; but what could practically have been done without the aid of steam and railways? Steam and railways have conveyed our specimens of live stock and implements, our exhibitors, and also the inquiring public, to the national gatherings: they have conveyed our corn to market, and brought back portable manures: they have deposited our supplies of fat cattle and sheep at the best markets, free from loss of weight, and have brought in return ready cash within a few hours. This is a mighty change from the old and dreary time, when animals walked slowly to market, wasting the food of the consumer and the profit of the grazier. These new aids shorten the space of time required for certain operations, produce certainty of of transit, and thus not only increase the food of the people, but materially aid in equalizing supplies and prices. In fact, if far removed from railways, we may be said to be deprived of the chief facility for our onward course; for they are daily spreading the intercourse between mind and mind, and are creating new markets and new demands for knowledge. With a view to illustration, if indeed it be wanting, I may mention the occasion of this evening's gathering. I have myself travelled 230 miles by railway to be present at this meeting. How many miles have the members of the club collectively travelled within a few hours? Even the thought of old "coaching days" makes one shiver. It may be interesting to mark the important progress in agricultural mechanics as another branch of industry, called forth by, and ministering to progress in agriculture. In the time of the Romans, Pliny tells us, "the corn being spread over the area of a threshing floor (a circular space of from forty to fifty feet in diameter) in the open air, a foot or two thick, it was threshed or beaten out by the hoofs of cattle or horses driven round it, or by dragging a machine over it." Again, we are told by the same authority, "corn was cleansed or winnowed by throwing it from one part of the floor to the other." This ancient picture presents a marked contrast to our present practices of threshing, dressing, and sacking corn at one operation, and leaving it in a fit state for market. Indeed, it is to steam power that we are so much indebted for the magical progress that has been made; and it is to steam power that we have yet to look for a much further development of the art of agriculture. Mr. Mechi has happily chosen this subject for a paper to be read at our next meeting, and I will not anticipate his remarks, which will no doubt be very interesting. In the early part of the present century, English agriculture had warm and justly-eminent patrons, and none more eminent or patriotic than the cultivators of our established breeds of live stock. It is to such men as the late Earl Spencer, Lord Ducie, Bakewell, Quartly, Stubbins, Bennett, Buckley, Burgess, Ellman, Chapman, Price, Booth, Whittaker, and others, that we are indebted for the production of our best breeds of live stock. With a view to show how great is our debt of gratitude to these men, I may observe that our beautiful breeds of cattle, sheep, and horses, have alike been cultivated from indigenous animals. If we examine the history of the sheep, we shall find that he has ever been an inhabitant of every clime, from Iceland to the regions of the torrid zone. Our English breeds were chiefly of a horned class; for instance, the Dorset, Exmoor, Norfolk, Yorkshire, Wiltshire, Shropshire, Welsh, Scotch white face, and Scotch black face, all had horns. Several of these breeds, which inhabit the yet uncultivated wastes, still remain, and are designated "horned sheep." I have said that Britain, in the earliest periods of her history, resembled all other countries under similar circumstances. There was nothing but bleak hills, undrained plains, and wild commons; but in the course of time, desolation gave way to husbandry, and with it came a corresponding improvement in our breeds of live stock. Thus it is that the old and unprofitable animals have given way or been transformed into the established breeds of the present day. We have had as an element those beautiful principles, which are laid down by Nature's laws, of the animal and vegetable kingdom to instruct us. These embrace a standard which man cannot alter; neither can he understand the object, without great scientific research and practical observation of the varied elements which compose the whole. It devolves, therefore, upon the husbandman to watch the laws of Nature, and to found his plans upon Nsture's dictates. The principles of these laws, worked out by proper rules, govern and direct the successful practice of the art of agriculture. I may best illustrate these remarks by mentioning a few of the principles recognized in our practice. First, there is the maxim that it is to the principle of steam that we must look for deep cultivation. Warmth is one of Nature's laws: hence "the principle of warmth" is good: "warmth is an equivalent to food." Animals consume or burn away carbon in their lungs, and waste heat. Vegetables store up the means of warmth. But every vegetable requires its own particular mineral food; and if this be deficient, the plant sickens. Vegetables also need fresh air: they imbibe food by their leaves. Each vegetable has its own "heat mark," below which it stands still. The drier the soil in winter, the warmer. A rough surface causes heat to radiate, and therefore keeps down temperature; therefore moisture is retained in summer by roughening the surface of the land. And in mechanics there are certain laws as to the balance of action and reaction; as the relation between power used and space travelled over and time consumed, the connection between speed and resistance or friction; from which laws there is no escape. We may sum up thus: Our Creator has given us nature to subdue. In the struggle with nature we learn our strength and our weakness. We find our strength increased by every effort; but the further we advance the more certainly do we know that there is something which cannot be done. In a word: the first condition for mastering nature in detail is to understand her general laws, and to submit to them. These laws then become living principles of science, and bear fruit in consistent practice. Formerly the handicraft of the husbandman was looked upon as the standard of success, without which he could not be classed as a "practical man." If he ventured to read or to act upon new designs, he was at once branded with the stigma of a doomed man. This state of things reminds me of an anecdote. A certain farmer, in the good old days, decided upon giving up his farm to the elder son. To effect this it was thought best to see "The Lord" in person. Accordingly "father and son" set out for the "Hall." Then came the familiar story—

> "The soil I now hold, on your honour's estate,
> Is the same that my grandfathers tilled."

This over, it was found a good opportunity for reviewing the farm. The dialogue ran thus: "You see, my Lord, we have all ploughed the 'Barn Close' for years, until 'tis tired out, worn out, and grassed o'er. We have been thinking, my Lord, that as we have all mowed the 'top Woodfield' for years and years, and it grows nothing but weeds, your Lordship would let this ere boy of mine change the system a bit, so as to let the 'Barn Close' lay down, now it has grassed o'er, and plough up the 'top Woodfield' that won't grow grass." His Lordship, not quite seeing the drift of the argument, summoned his agent from "Chambers" to the country, who proceeded to view the fields; subsequently agreeing that as the fields represented the story told, and the good old man could have no interest in placing his son in a false position, the change should be allowed. The ride was prolonged and all went well until the London agent dived into matters "purely agricultural," by remonstrating with the son as to his not taking "two white crops" in succession, saying this he could not allow. The old boy at once came to the rescue, and quaintly replied, "Quite right, your honour, quite right; there's nothing like a change. It has always been our custom to sow wheat, and then black oats between it and the barley; and I wish the boy to do the same." Whereupon the agent apologized, and agreed that the black oat crop between was an excellent thought, and evidently constituted what he had heard so much about, viz., "the alternate husbandry!" (laughter). Such was the state of things when the "handicraft" of the husbandman was looked upon as the only standard of success. Happily for the increasing population of the present day, this handicraft state of things is passing away, and we have in exchange not only the modern practices of the art, but the free discussion of all subjects which relate to the "progress of agriculture." More especially is this the case at the Central Farmers' Club. In reviewing this auxiliary I feel bound to give praise where praise is due. The happy formation of this Club on the 28th June, 1843, at once announced a new era in the annals of our agriculture, inasmuch as our very excellent and intelligent friend, Mr. Baker, of Writtle, was invited at the outset to introduce the subject of "Artificial Manures," for the free discussion of the members. Since that period this interesting topic has been discussed ten different times, and there have been up to this date no less than one hundred and ten subjects discussed by the members, each of them relating to agriculture. The question of "Tenant Right" has been before the members ten times. The agricultural labourer and his education seven times; and draining and root crops five times each. The important subjects of geology, diseases of cattle, agricultural statistics, agricultural machinery, waste lands, food of cattle, farm leases, sewage manures, the breaking-up of grass land, carts and waggons, deep cultivation, the influence of science, the rotation of crops, weights and measures, allotment system, and the education of the farmer's son, have also shared the attention of the Club. This is a result which may be written upon the broad pages of our history, in the book of agricultural progress. Well may it be asked, "What should we now do without this Club?" What would the five hundred members think if their Bridge-street sessions were terminated, and the Club disbanded? Let us rejoice that "union is strength;" let each contribute to the cause by introducing new members—only one—and our strength will be increased twofold. I have noticed that this Club has now discussed some hundred and ten subjects relating to English agriculture, none of which have convinced me so much of our growing position as the one recently introduced by Mr. Bond, upon education. That gentleman has well reminded us of the necessity of keeping pace with the times; and that it is to man's mental powers that we have to look for the future advancement of agriculture. The sons of agriculture must have an improved education, an education that will now grapple with advancing science. Formerly the mere routine practices of the year were sufficient to make a farmer's son a "practical man," and the country schoolmaster was an ample teacher for the age. But now, thanks to advanced education and scientific men, we live in an age of progress, and have yet a new era before us. And if this be a truism, then I may ask, who shall hold his own without steadily embracing the improved facilities for education that are daily being opened up? The great point to be kept in view in the farmer's education is not to cram knowledge into the boy's head, but how to give him a good strong head; and I must add also, how to keep his heart warm. It is true that a great deal of scientific knowledge is required for a perfect theory of agriculture. But is it necessary for perfect practice? Is scientific training in early years the best means of preparing the man for the exercise of sound judgment? A perfect mastery of our own noble language is essential to express our own ideas clearly, and to understand those of others. It is generally understood that the best way to acquire a knowledge of our mother-tongue is to learn another language, ancient or modern. The great principles of mathematical knowledge lie at the root of all sound mechanics, and prepare the mind for accurate calculation, for winnowing out the real point at issue, and blowing away the chaff. I have it on the authority of a schoolmaster, whose success in recent examinations is well known, that such an education as I have referred to is appreciated by no class more decidedly than by the leading yeomanry. I may also call the attention of this Club to the fact that one of the first steps towards the improvement of the general education of England was taken at the council of an agricultural society, and is recorded in the fifth vol., page 431, of the Bath and West of England Society's Journal, to this effect: At a meeting of the Council, held at Taunton on the 28th of March, 1857, it was resolved unanimously, "That the Council fully assent to the opinion that skill in business generally is best acquired by practice, and that the best preparation for practical life is a good general education; that the co-operation of some independent examiners, with a local committee, appears well calculated to secure confidence in the results of the examinations." On these two resolutions were founded the measures for university local examinations now adopted in all parts of England. The spirit of commerce or gain urged men to an examination of substances which by their application will enable the farmer to raise larger crops, and continue their culture, without exhausting the soil to the prejudice of succeeding ones. This search for extraneous matters seems to have been pursued as an art, for science at the time had not extended her researches in this direction; though as early as about 1600 many substances now used as manure were mentioned as enriching the ground, to wit, the dung of oxen, sheep, or pigeon; sea-kelp, see-tangle, and other sea-weeds, for arable and pasture land; and the dregs of beer and ale, brine of the strength of 1 of salt to 18 or 20 of water, the soot of chimneys, and the refuse from the refining of petre. Shavings of horn are mentioned as making productive a most unfruitful plot of ground; as also waste soap-ashes, malt-dust, and oat-husks. We may remark that Virgil even says he has seen husbandmen wet their seed with nitre and the lees of oil, that the grain might be larger. Gypsum was used as manure in 1770, and crushed bones in 1775. Now, in the foregoing we recognize many of our manuring principles; but these were not generally known and used, or, when used, they were only applied as specific substances without any but fanciful ideas respecting their mode of fertilizing, and their use was therefore empirical. It was reserved for the science of chemistry to point out the connection between these fertilizers and their produce, to discern the presence in the two of certain elements which were the true cause of their manuring qualities, and thence to teach us that wherever the same principles could be found we might rely upon a similarly happy result from their employment. In 1790 a professorship of agriculture was founded at Edinburgh, the Highland Society having been instituted in 1784. The Board of Agriculture was established in 1794. The Royal Agricultural Society was instituted in 1838. A professorship of agriculture was founded at Oxford in 1840. In 1840 the College of Chemistry and Agriculture was founded at Kennington by Messrs. Nesbit. In the laboratories of this establishment these sciences, with geology and botany, have been illustrated, and their application has been set forth by Mr. Nesbit's lectures and publications. In 1842 a college was founded at Cirencester, which received a charter under the name of the Royal Agricultural College, to which Professor Way, and afterwards Professor Voelcker, were attached; and there also the application of the sciences to agriculture has been taught. To Sir Humphrey Davy agricultural chemistry is much indebted, from whose time till that of Liebig no chemist applied himself to the application of chemical principles to the growth of vegetables and to organic processes. Liebig gave the greatest scientific stimulus to agriculture by suggesting the use of vitrol or other acids to render the phosphates soluble, and therefore more quickly available for the nourishment of the plant, which result was immediately acknowledged from its first trials in 1840 and 1841; the effect of this solubility being to bring the turnip quickly past the fly. About 1840 guano was first introduced into England. It has, undoubtedly, been a great boon to agriculturists; for, besides a large amount of nitrogen (the active principle of horn, soot, and other ammoniacal manures,) it contains phosphate of lime, a manuring principle of bones, some being in a soluble state, and having therefore the properties of dissolved phosphates. Coprolites were discovered to be manure about the same time (that is, about 1840); and, though their phosphate of lime is in a condition unadapted for solution by natural causes, by reducing them to a fine powder and treatment with acid it is dissolved. Thus we have opened up to us an amount of mineral manure of vast extent, the discovery of which has, happily, been simultaneous with that of a process necessary for its proper utilization. It is to deeper cultivation and the improvement of our waste lands that we have now to look for the extension of our acreage produce. The earliest records of substantial enclosures date from the earliest period of the reign of George the Third, in 1760. The passing of more than three thousand bills of enclosure in a reign of sixty years is a proof how rapidly the cultivation of new land proceeded in that period; and, while the rent-roll of proprietors has been doubled, tripled, and quadrupled by this cause, the condition of the tenantry and of the labouring classes has been ameliorated in a proportionate degree. England exported corn up to the end of the eighteenth century; but this period was about the turning-point—a sort of pivot-period, when exports and imports nearly balanced each other. The enclosure of land now begins to mark the consumption of a gradually-increasing population and trade. A committee of the House of Commons, which set in 1797, computed the total quantity of land enclosed during that century at about four millions of Acres. We have in "Spackman's Analysis of the Occupations of the People" a complete record of the progress of inclosure from the commencement of the present century to the year 1840, viz.—

From 1800 to 1810	1,657,980 acres
From 1810 to 1820	1,410,930 "
Total	3,068,910 "

Thus, during the first twenty years, the inclosures amounted to upwards of three millions of acres. But while these twenty years present to our view the phenomenon of immense inclosure, it must be stated that this took place under the stimulant of the highest range of prices for food ever known, except in cases of famine. At the close of the war in 1815, the average price of wheat had been during the preceding fifteen years 84s. 9d. per quarter, and during the succeeding five years it was 78s. 4d. From 1820 the whole scene changed, and the most trying period commenced, the causes of which are now apparent. Three million acres of moderate land had been taken in hand, and a metallic currency was resorted to. The inclosure from the year 1820 to 1830 only reached 340,380 acres, thus gradually bringing round the natural remedy for the over doses of inclosure which the war had prescribed. From 1830 to 1840 only 236,070 acres were inclosed, showing that supply and demand had not yet righted themselves. Thus during the forty years we have an addition of three and a-half millions of acres to the cultivated lands, against an increase of upwards of 8,000,000 in the population. By the census of 1801 the population of Great Britain was shown to be 10,472,048; in the year 1841 it had increased to 18,664,761. Spackman then tells us that in the year 1800 we had under cultivation 42,000,000 of acres, which produced food for ten and a-half millions of people. The General Inclosure Act was passed in 1835. The fourteenth report, which has just been presented to parliament, gives the following figures—

Applications for inclosures since the passing of the act	809
Exchanges	1,697
Partitions, &c.	161
Total	2,667

Of this number 316 have taken place in the last year.

Acreage of inclosures confirmed			281,949
Ditto	ditto	in progress	208,687
Total			490,636

Or in round numbers half a million of acres. These returns embrace a period of five years, which were included in the last decennial period from 1830 to 1840, but I have no power of separating them. It is estimated that there are still 15,000,000 acres of waste lands capable of improvement, 6,000,000 of which would make arable land, and the remainder improved pasture; but as the high prices from 1800 to 1820 caused the inclosure of land to an extent never equalled, so in the proportion to the decline in prices, inclosure has also declined. Still, applications for assistance to drain and improve waste land continue to be made; and the English yeoman will, as he ever has done, adopt whatever improvements can be suggested by experience, as rent-paying practices. A national report of the waste lands of England and their capabilities would be an interesting and valuable document at this stage of our progress. Be it remembered that our population is increasing beyond a thousand per day, while the acreage of our island remains the same; and that there is a certain limit to the high farming of richly-cultivated lands.—Amongst the many and varied practices that have aided the progress of agriculture may be mentioned the practical results of chemistry and artificial manures. These have enabled the farmer to quadruple his green crops, to place the right manure in the right place, and to economize the cost of production. The art of draining is another marked improvement of the age, which dates its further development from the "Government loans" for this purpose, which loans were the result of early private practice, acting on public opinion. The improvement in draining-tools and in draining-tiles has contributed to the success that has been attained, and is rapidly progressing; for without this auxiliary, upon certain soils cultivation is simply useless. The growing knowledge of atmospheric influences has had its share in the work, and gone far to arouse the dormant intellect upon points relating to geographical position, the geography of plants, the influence of light and heat, seasons, winds, &c. The enclosing and improvement of waste land has also formed a prominent feature; and the improvement of local and farm roads is a link in the chain of progress. The attention which has been directed to the education of the labouring classes, the improvement of their cottages, and the allotment system has not been without effect, each of these being an evident requirement for the improved class of men who are daily being called into request to perform the altered cultivation upon the farm. In effect the occupation of the man who thrashed the barn-floor for the natural term of the winter months, is gone. His son succeeds him as an engineer, or the director of a steam-engine! The improvement in farm buildings is another requisite for the time, and has been liberally carried out for enterprising tenants. The "rotation of crops" has of necessity received much attention, alike in the field, in the laboratory, and in the discussions of this club. The practical issue is this: the four-course shift was invented and adopted for the purpose of improving the land; this has been done to a heavy amount, and it now requires correction, by the introduction of another corn crop, extending the four to a five-field course. The Scotch system is that of the six-field course—roots, white straw crop, seeds, white crop, beans, and white crop. The extension of root and other green crops since the introduction of artificial manures has contributed to the increase and excellence of our live stock, in a truly marvellous degree—a profitable result. Agricultural statistics have been the subject of many attempts; but although we have had many interesting statements with regard to agricultural produce, the movement has not been received very graciously. Time alone can show how far an altered taste may lead to different results in future years.—Irrigation is a practice which, although chiefly confined to the western counties, has deserved well of the farmer. It has done its part in the production of green food in early spring, and abundance of hay at shear time, at a nominal outlay. This practice is well worthy the attention of proprietors and tenants of hilly districts, "where the plough cannot penetrate," but "the rippling stream can flow." At the request of Mr. T. Dyke Acland, a paper "On Water Meadows as suitable for Wales and other mountain districts" was prepared by Mr. T. Barker, of Pusey (agent on the Pusey Estates), for the last Journal of the Bath and West of England Society. I mention this because the paper is not only well worthy the attention of all "hill farmers," but is about to be reprinted for general use, especially for the principality of Wales and the Westmoreland Lake districts. The grass lands of England have also received some attention of late, but by no means in an even ratio with the favoured arable lands. There is indeed, a nice point of distinction to be drawn on this head. Can we improve moderate grass land by top-dressing to a profit? or are they such as would pay best for cultivation? Local circumstances can alone decide, climate being the ruling power. As regards the tenure of land, the question of an equitable arrangement for ensuring good cultivation versus loss of time and capital, when tenants are changing farms, has been freely and fully discussed of late, and discussion is happily resulting in a better understanding of the necessity for an arrangement. Progress will effect much in this way; and although we may be met in the outset by opposition and by surprise that there should be such a term as "tenant right," equity and improved culture will ultimately become the universal practice. In fact, the principle is being acted upon in present lettings, to a considerable extent. The subject of "agricultural customs and covenants" has been fully before the council of the Bath and West of England Society, and the result will shortly appear in the Society's forthcoming Journal. Deep culture by the aid of steam-power is yet in its infancy; but, as a consequence of progressive art, it will ultimately do much for agriculture, by deepening the tillage earth of countless acres which cannot be profitably moved by any other power. This leads me to the remark that there is yet wanting a better comparative knowledge of the several powers engaged in agriculture, such as steam, horse, water, and manual power. On the subject of "horse power," we have an excellent report in the last Journal of the Royal Agricultural Society, by Mr. Morton. It should be well read, and weighed against the present papers that are being daily written upon steam-power, lest our zeal for "things new" should carry us out of our depth—or we might say below our depth. As regards manual labour, we are daily seeing it supplanted by mechanical aid. From my present acquaintance with water power in a hilly country, I can strongly recommend it to all who have the power of water within reach of the farmstead. The enormous additional weight of green food that has been produced of late has rendered practicable the maintenance of larger herds of cattle, increased flocks of sheep, &c., and thus supplied an additional weight of *animal* food for the growing wants of the people, and the increasing *foreign* trade in English animals; while the fact that the price of meat keeps up, while corn has fallen, has happily falsified some doleful forebodings. The practical value of these increased products is best illustrated by a quotation from Mr. Middleton's work. He observes, "that every acre would support its man, on *vegetable* food;" but, says he, "only let him change his diet to one meal per day of *animal* food, and he will require the produce of four acres." In connection with root crops may be mentioned the intrinsic value of mangoldwurtzel. It is being cultivated to an enormous extent, and has happily come to the rescue of many a farm where the Swedish turnip has become less hardy than in former years, or, more properly speaking, less inclined to flourish on the same soil, once in four years, under the four-course system of husbandry. Autumnal culture has stood the test of experience, and remains as a valuable saving in the cost of clean farming; but as respects light lands, the practice is yet a doubtful one. This class of remarks might be carried on for an hour: there are indeed so many plans for every branch of our art, that I had better conclude by referring members to the pages of the Royal Agricultural Society's Journal, and those of the Bath and West of England Society's Journal, as records of all that is good and worth recording. The extension of commerce and manufactures has proved a valuable adjunct to the increase and consumption of agricultural produce. More raw materials, as flax, wool, &c., are required, manures from foreign lands are exchanged for goods, and we must not omit the precious metal, and its abundance to this country, whereby all things agricultural have shared in the golden harvest so unexpectedly supplied. The ultimate results of the gold discoveries it would be unsafe to predict; suffice it to say that the effects of the increase of gold require the serious forethought of the statesman. Amongst the facilities that have recently been afforded to agriculture, we may mention the Government Drainage Act, the Inclosure Act, the New Poor Law Act, and the Tithe Commutation Act. The advantages afforded by the Fire Insurance offices, the Drainage, Building, Hail, and Cattle Insurance offices, have each in their way helped along the well-being of those that are prominently interested in them.—Thus far, I have given a glowing account of the "progress of agriculture" from the early ages to the present time. But what shall I say of our disappointment and misfortunes? We have, in truth, had our vicissitudes and losses by the diseases of our live stock, wet harvests, failure in our root crops, and low prices for our cereal produce, while the cost of manual labour has (from various causes) increased. Again, it must be mentioned that the English farmer has to depend upon his own exertions, and cannot look to Government grants or Government assistance. He has no statistics or history of his art; he has no adjustment of his weights or measures, no board of agriculture, no minister or representative in the State. But yet he has held his ground, and continues to feed the people. The future of our agriculture is full of interest. There are subjects before us well worthy of consideration. Amongst them is a growing desire to treat agricultural pursuits upon "commercial principles." From this cause the occupation will become commercial, small farms will have to succumb to large ones, talent and capital will reap their reward; education will progress, the tenure of land and security for unexhausted improvements will become matters of fact, as commercial transaction. The project of steam-power has been boldly launched, and the ingenuity of man is now at work to adapt it for general employment; but this is yet a venture, and has an eminence to surmount that will require the talent of an age. The Royal and West of England Agricultural Societies have each offered a liberal prize for an Essay "on Steam Cultivation. These prizes may bring out an amount of talent that may aid the movement; but the "plant" as yet produced is far too costly for general adoption. There is yet considerable room for perfecting our breeds of live stock, that they may become more generally developed in "every district, and the right animals be cultivated in the right place." The economical consumption of their food, early maturity, and a better knowledge of their diseases, are alike essential to our future good. The extension of draining is another very important element; and it would be well if the Government grants were extended upon a liberal basis. The waste lands of England are again waiting for improvement, and offer an inviting field for enterprise in juxtaposition to that of emigration to "a land we know not of." Artificial manures are yet in their infancy; it being no uncommon thing to realize and consume a crop of roots before they are paid for, thus commercially-improving the farm by manures and sheep to the full benefit of every one, at little cost to the farmer. The improvement of grass-land is indeed a national subject, and must follow the advances of the arable lands. A series of experiments upon grass-lands, conducted under the management of an agricultural society, would elicit much practical information as to the results of different manures, the soil and situation being well considered. Amongst other public questions, there yet remains for consideration an adjustment of the "weights and measures" by which agricultural produce is sold; the establishment of a better system of taking the corn averages; a reconsideration of the malt tax, agricultural statistics, the adjustment of the game laws, so as to substitute "winged game" for the four-footed trespassers; a better understanding of the law of "customs and covenants," as regards the quitting of a farm; an extension of the Government draining loan; and lastly, the preparation of a new and complete "Ordnance map," upon a large and comprehensive scale, under the direction of the Government (cheers.)

From the British Farmers' Magazine.

London, or Central Farmers' Club.

EDUCATION AND DISCIPLINE OF THE YOUNG FARMER.

The Monthly Meeting of the Club took place on Monday evening, March 7, at the Club-house, Blackfriars.

Mr. Trethewy, in the absence of Mr. John Thomas, the President of the year, was called to the chair.

The subject for discussion—introduced by Mr. R. Bond, of Kentwell, Long Melford, Suffolk—was, "The education, discipline, and introduction of the young farmer to life."

Mr. BOND said: Mr. Chairman and Gentlemen, we have this evening to consider and discuss an unusually important subject; and it will be well for us to bear in mind, that we have not simply to determine a mere material question, embracing the cost of agricultural production, or the increase of our pecuniary gains; but we have this evening to dwell upon the culture of mind, not matter—of man, not material. We have this evening to dwell upon the cultivation of the cultivator of the soil himself; and much may fall from our lips which may tend not only to form a character and fix a future; but I admit it will be a matter of regret with me if we do not succeed in propounding and moulding the formation of a system which shall be calculated to meet the increased educational requirements of the age—a system which shall ultimately be instituted to exalt the intellectual standard of the agricultural character, and which shall be destined to increase the mental, moral, and physical greatness of Old England. You will plainly perceive, gentlemen, upon the question of agricultural education, I am an advocate for action and co-operation; and I am extremely desirous to see the Central London Farmers' Club occupying the proud position of a pioneer, practically, in every agricultural movement of desirable progress and undoubted usefulness, and I trust, in this instance, we shall this evening not only consider wisely, and discuss fully and freely, but that we shall resolve, prudently and firmly, to carry out to a successful issue some desirable agricultural educational movement. In this age of change, progress, and improvement, no change has been more marked and decided than the altered position of our British agriculture within the past fifty years. Not half a century since, and the agricultural art was comparatively pure empiricism; it was practiced without science, practiced without the light of reason; and the standard of agricultural intellectual attainment was necessarily low and meagre. Agriculture, as a purely imitative art, required no depth of knowledge even in its best qualified professors. There was nothing in a simple course of routine to tax the mental powers. But within the present century how marked the change! We have now the widest field and the most extended scope for intellectual exertion; we have now the whole of Nature's laws opened up for our investigation and research. There is scarce a science but bears directly or indirectly upon the art by which we live; and for a rational fulfilment and a thorough comprehension of agricultural practice, I know of no business or profession at the present day requiring a deeper knowledge or a higher degree of intellectual attainment. Agriculture is no longer a mere blind question of plowing and sowing; but agriculturists now require to understand the object, reason, and result of every mechanical operation. They require to know why plowing benefits the land; why draining answers; what the plant derives from the soil, what from the air; why one manure as applied to the soil answers, why another fails to answer; how light and heat affect the plant; how they influence the crop; why the animal thrives well upon one kind of food and not upon another—to say nothing of the structure of the plant, the anatomy of the animal, the construction of machinery, and many other subjects requiring the greatest mental application to qualify any man to comprehend the intricacies of Nature's laws and the complications of Nature's operations, which it is the farmer's greatest success to subscribe to, to foster, and promote. With such a flood of light and scientific knowledge as the past fifty years have produced, has the agricultural educational system or the educational standard of instruction kept pace? We have this evening to express our opinion, and we have to pronounce our verdict upon the fitness or unfitness of our present system of education to the altered and elevated position of British agriculture. It is necessary upon this subject we should speak out; and allow me to propound the question—Are the youths and young men of the rising generation so educated upon the best principles of instruction that they are thereby best fitted to cope with their future position? Are they so educated in the knowledge essential to their calling, that they will prove equal to the requirements of their business? Are they so educated, that they are thereby fitted in intellectual attainments to the altered and scientific standards of their profession? Will they prove thorough men of business, thorough in knowledge, thorough in judgment, and successful in practice—really thinking men? Or will the result disclose the fact that there is rottenness at the core of our existing system of education and discipline? I know, well, such questions as the foregoing may be met with the conservative plea that we have done well enough in the past. In such an opinion I fully agree. Without much education the farmers of England have cultured England to a degree of perfection unknown beyond her shores; without severe educational training, we have succeeded in beating the world in agricultural productions; without a deep knowledge of science, we have practically solved the most scientific problems; and, till recently, science has rather followed in our rear than advanced as our vanguard. But because we have succeeded practically, and that most successfully, shall we reject a proffered aid? Shall we reject the helping hand of a helping handmaid? Shall we, who have practically preceded science, close our minds to the enlightening truths of science? Shall we, who deal in the culture of Nature's products, close our eyes to the revelations and explanations of Nature's laws? Shall we blindly continue in empiricism, when reason waits to reveal the *rationale* of every operation? Can we afford to reject such knowledge for the rising generation of England? for those who will quickly occupy our positions, who will have to uphold the honour of England's agriculture in a world-wide race—against some odds—in a world-wide competition? Will they not need the stimulant and assistance of every adventitious aid? I am well aware it may be said that the best-educated are not always the best farmers or the best men of business. This is perfectly true. I know of men whose school-history is a farce, and their educational chance was at best but a poor one. I know of such agriculturists; yet those very men are possessed of such sound common sense, of such caution and prudence in the affairs of life, of such clear observation and shrewd reflection, of such prompt and defined judgment, that in any age they must be noted as men of no common mould: but let it be remembered, that facts and information are the basis of their correct reasoning, of all correct reasoning, of all soundness of judgment; and a greater knowledge, in their case, of Nature's truths, would but have made them more powerful men in Nature's laws, and in the practical operations of every-day agriculture. Such men, with a storing of scientific facts, would but have been more prominently the pioneers of progress; and though I condemn the nonsense that a man cannot farm without a knowledge of the sciences, yet I broadly propound the fact that the truths of science, especially in our own heads and hands, are admirably calculated to introduce us to more paying processes, and to insure to us increased pecuniary returns. I am not ignorant of the marked improvement which has characterized the agriculturist of the present age: I believe no section of society has more advanced in intelligence, knowledge, and position. Capitalists and capital have reduced the small holdings, banished the old feudal system of favouritism in business, and supplanted a degrading subserviency by an exalting respect. Men are now rare who are agricultural bores or inveterate grumblers; and though there is still the disposition in society to assume the fact that the agriculturist, however unlimited his capital or his ability, has no right to a position in society, or to the modern refinements and amusements of life, yet England can boast of sons of the soil, high in intelligence, exalted in principle, and thorough in business—men of whom even England may justly be proud; yet, notwithstanding this vast social and intellectual improvement, when I view the relative positions of the sciences bearing on agriculture, and the scientific culture of the agriculturist, I can plainly perceive a vast distance of space. Scientific truth is far a-head. Individually I feel it. Thanks to the revelations of our Liebig, Lawes, Gilbert, Playfair, Way, Nesbit, Voelcker, Johnson, and others, that science is not in advance of our practice; but science is infinitely in advance of ourselves—she has much to suggest to us, much to tell us, much of which we cannot afford to be ignorant, and all of which the rising generation ought to know, ought to aspire to, must acquire; that, as agriculturists, they may base their reasoning on correct data, and improve by their reflection and research the agricultural practice of the kingdom. The British yeoman has been always noted for that sound common sense, which, though no science, is fairly worth the seven—a common-sense, which could neither be won by a fallacy, nor be deluded by a delusive theory. Profit has justly been his badge of discipleship; but it is necessary now to combine, in the same person common-sense with agricultural science; it is necessary that the future and rising generations of farmers should possess the highest intellectual attainments, and I believe it requires a severe discipline of study to master the intricacies of scientific agriculture, and a rare combination of powers correctly to carry out the principles involved in the most successful practical issue. I advocate a thorough proficiency in the sciences, because I believe such knowledge is admirably calculated to increase the pleasure and profit of farming; I believe it is the precise knowledge necessary to prevent mistaken outlays and wrong applications; to insure the placing of the right manure in the right place, the giving the right food to the right animal, and the doing the right thing in the right way; to lessen the cost of production and to increase the annual returns; to win more fully the prize we all have in view, viz., money, or money's worth—to secure by scientific culture a secular success. I will now enter upon the question of education, and I purpose to consider the necessary changes in the course of study to be pursued, and the system of education necessary, in the agricultural schools of England. What then is our object in education? It is to draw out the latent powers of youth; to culture for the future as well as for time; to discipline the heart as well as to inform the intellect; to make happy men, respected men, men beloved by their fellow-men, and to insure success in life? Let it be remembered that education is not a mere matter of schoolmasters and of school discipline; parents cannot, in reality, delegate their responsibilities. Rely upon it, education commences at a much earlier stage than we commonly recognize; and from whom the child learns his mother-tongue, from the same does he imbibe his principles. We speak of breeding and blood, as if hereditary likeness arose from the simple fact of parentage; depend upon it, the force of imitation, and the power of influence and example have more to do in the formation of a character than the power of descent. We who are accustomed to the maxims of breeding admit, as a fact, that much size goes in at the mouth—that the quantity and quality of the food govern the physical development of the animal; and rely upon it, the mental inclination and the dispositional development of the child are governed more by those quick and early inlets to the soul—the eye and the ear—by the influence of those around them, than by any inert inborn principle. We are daily becoming more alive to this fact in the careful selection of servants, and in the choice of playmates and companions; and I enter into this digression to show that the boy may have received a wrong impression long before reaching the hands of the schoolmaster, and the tutor has probably to deal with a spoilt child, instead of a promising, well-cultured, well-trained boy; the twig has received the wrong twist, and to rectify the past, to antidote past poison, to regain wasted opportunities, and, at the last, to stand well in the race with so unpromising a colt, is more than we have a right to expect; and I here express my conviction that more than half the failures and sorrows of life are traceable to the want of the proper fulfilment of parental discipline, extending from childhood to the age of twenty-one years. I am a great advocate for the culture of the heart as well as the culture of the head; no man is truly a man without it; and it is especially the duty of parents early to implant, to foster, and to uphold sound Christian principle; to culture in acts of reverence, in feelings of love and affection, and in deeds of unselfish kindness; to insist on obedience and truthfulness. And it has been my observation that without this Christian security the most successful secular life is at best but a mistake, and the most hopeful intellectual attainments a comparative abortion. There must be the ballast of sound principle, or right feeling, and right doing, as well as the sail or the steam-power of ability. Education cannot be purely secular to be successful; and though my observations on this point may appear beyond the mark, yet I plainly assert that no education is perfect, no prosperity sure, no happiness complete, which is not based on Christian principle. I have informed myself, by an extensive correspondence, upon the course of agricultural study generally pursued throughout the kingdom. In the Colleges, such as Cirencester, Kensington, and Queenwood, the whole course of study is enlightened, suitable, and satisfactory. In the local schools, generally, the sciences are much neglected; in more than one-half of the prospectuses received from such schools the sciences are not even mentioned, and in many, where alluded to, it is a foot-note, to state—"taught if required." Now, it is not the fault of the school-master that this is the case: it is for us, as agriculturists, to make up our minds, to have clear views upon this point, and to express our wishes. It is for us to say whether these things ought thus to be. I observe there is the same dunning at Latin and Greek as when I was a school-boy, and I dare say there is the same plausible reason given for the continuance of the system, viz., discipline. Now there is no one a greater advocate for mental discipline than myself, but why the dead languages are so infinitely superior in their influence I cannot for the life of me conceive. To me it appears such studies may make boys word-searching mental-memory machines; but what is there to excite the observation, to induce inquiry, to lead to reflection and real thought? Now, where the dead languages so essentially fail, the sciences so eminently succeed. The sciences dwell upon subjects of real utility—subjects which meet us at every turn; and such subjects of every-day life are ever suggesting consideration and research. They constantly interest the boy, and teach him to use both his perceptive and reflective faculties. The boy sees a plant, and contemplates its construction; he thinks over the process of vegetation, the works of the roots and rootlets, the ascension of the sap, the functions of the leaves, and the whole busy process of accelerated nature most actively working to manufacture food for man. He sees a steam-engine, and at once examines its manufacture; he understands its mechanism, and contemplates the possibility of some mechanical improvement. All nature and art, to a mind scientifically cultured, are vast fields of interest, of observation, and thought. Surely, then, gentlemen, for those destined for agriculture, a study of the sciences is the course to pursue, to manufacture thinking boys and intelligent thinking men. Give the boy an early bent to understand the why-and-because of all around him; you thus place before him a deep mine of wealth, which it is discipline indeed to comprehend, and a study throughout life fully to acquire; he never lacks a subject for intelligent thought, and you culture the mind, by a gradual process, to make constant efforts; the knowledge and facts acquired, all bearing upon agriculture, are literally power—power to apply in the manufacture of meat, and the manufacture of corn; and you cultivate, at the same time, that indispensable guide in all the business transactions of life, viz., a thoroughly well-balanced judgment. Now, gentleman, what do the dead languages effect? They simply train to a word-research, to the cultivation of the memory, and they teach the derivation of words. Too often the dead languages, indirectly, have even an injurious influence: they erect a wrong standard in the minds of youth; boys view a high attainment in the classics as far transcending a common scientific knowledge of common things; they despise the useful; and that acquisition of the languages, which you intend as discipline and as a means to an end, they cling to and believe to be the end itself. When I turn to my own experience I can plainly perceive that two years' study of the sciences have proved of more benefit to me than many a year's grinding at Latin: in my education every one pound's worth of science has yielded a larger return than each ten pounds expended in the classics. In the sciences I was interested, I could understand their usefulness, and upon leaving school, it afforded me pleasure to prosecute my studies, and each day in the agricultural world I find something to observe and learn and turn to practical usefulness. Upon the scholastic studies generally, I would observe, it is highly desirable every boy should be able to read clearly and fluently, without hesitation and stammering; it is equally desirable he should be taught to write a good, plain, legible hand, apart from all curvilinear flourishes, rectangular excrescences, and the complete ambiguity which characterizes the writing of the present day. Let each boy, too, be especially well-grounded in arithmetic; by some means implant a taste for figures; for the system of good and correct accounts, in every matter of business, is one of the grand secrets of success in life. Of course there are grammar, spelling, and history to be learned; but I am convinced upon these subjects there is much time wasted. I forget how many works on grammatical rectitude I succeeded in wearing up. I know several; and that, too, in learning by rote rules which I never knew how to apply, and in attempting to rectify sentences which were designedly made wrong. In spelling, the same: it was my duty to correct misspelt words; but I candidly believe it would have been infinitely more to my advantage that I should never have seen the grammatical and orthographical mistakes, as the eye and the ear became habituated to and familiar with error. I am convinced I not only wasted time, but that I received a positive harm from the process. Again, let a knowledge of sacred and profane history be acquired; but I must confess I could not, nor can I even now, see the utility of learning by rote the dates of the ascension and death of every monarch who has occupied the English throne. A knowledge of geography is, of course, desirable; also a knowledge of mathematics. I believe the plans of theme-writing and of close verbal questioning, upon every study, are most desirable, as ensuring a thorough grounding, which is the basis of accuracy, self-reliance, and after self-development. To me it appears, too, most desirable that the parent, if competent, should regularly and carefully examine his son, and thereby note his progress; but for general, every-day, local schools to be useful, we require reform. We require a public board of agricultural examiners, who shall duly examine each candidate, in the first instance, at sixteen years of age, in all that constitutes a sound agricultural education; we should thereby introduce competition and a standard of merit, and the most meritorious, painstaking, competent master would have the largest proportionate number of successful boys. I advocate such reform, to rid us of incompetent masters—to secure patronage to the deserving; and the mere fact of such an examination would excite a spirit of emulation amongst the boys themselves; and often, in their hours of wished-for idleness, would they remember they must render an account some day; and that the fruits of indolence would be exposure and disgrace. Such a public system of examination would ensure the general adoption of the most desirable course of study, and force up schools to the necessary standard of proficiency. At the same time, such a system would embrace agricultural schools of every standing—the small as well as the large—and have a general influence for good. In ten years, so radical would be the change, that Dickens—who, in "Nicholas Nickleby" justly caricatured the old system of education—would see an almost undreamed-of reformation. Further: upon a youth leaving school, the necessity is obvious for continued intellectual discipline; and how requisite it is for a young man to have continually some intellectual object of attainment before him! I note the present system: a boy leaves school at sixteen years of age; he throws up his hat, and concludes his education finished, when, in reality, it is but just commencing. More than half the young men destined for agriculture in England actually waste, and worse than waste, the first four or five years of their freedom from scholastic restraint. Theirs is a thorough desultory life; they throw up all intellectual culture, and they have no intellectual standard of attainment to which to strive to attain. They probably assist in the farm-management; but as they have no responsibility, the farm occupies but little of their thoughts; as they feel but little interest, they observe but little; and the rat-hunt, the cricket-match, the run with the harriers or fox-hounds, the quadrille-party, the shooting exploit, with other amusements, combined with a profusion of tobacco, are their real employments—their true business of thought and occupation. How are the evenings spent? Often in a desultory, do-nothing industry, or in card-playing and smoking—in colouring a clay or idolized meerschaum—or, if in literature, in pursuing some trashy love-tale novel, in studying "Blaine's Encyclopædia of Rural

Sports," or in reading the last number of the "London Journal." I speak, gentlemen, from facts, from my own observation; and only in ridicule, I fear, can it be said that such training will create promising candidates for future agricultural honours! This is not a desirable course of discipline: reared in a desultory manner to sport and to spend, to study their own pleasure and indulgence rather than their interest, and advantage, it will be no matter of wonder or surprise if pleasure is their chief engrossment in after-life, and if business, at the commencement of their career of responsibility, finds them deficient in knowledge and judgment. Such, gentlemen, is literally the case. I have seen young men make grand mistakes upon their first start in life, from absolute incompetency—especially upon clay-farms; and I agree with the observation of an old friend of mine, that it would well answer the purpose of many a young man, upon commencing business, to pay an elder to superintend and direct him in his management and supervision for the first two or three years. I am in no way averse to a reasonable amount of sport and amusement; I have had my share, and that a large one, of hunting, coursing, shooting, and the like, and I believe, too, without detriment; but let it be the condition that whilst sport is sport in reality and in earnest—whilst a young man rides across country with courage and judgment, and sports as a sportsman—that business and study are equally pursued with the same spirit of indomitable energy and perseverance. We hear a great deal too much, now-a-days, of the old tale that "All work and no play makes Jack a dull boy." The truth is, that more work and less play would make Jack a bright boy, a business youth, and a thriving, successful man. I am for pleasure in reason, but for business in earnest; and in every case I desire to put aside the dreary, indolent, listless nonentity spirit which characterizes young men, both in their intellectual improvement and in their business attainment and attention. I want to see young men fresh from school, not only breathing, but really living—living for an object—living for an end, and actually using the means to attain that end. I want diligence, and not a passive indifference, to govern their conduct. I want them to feel that time is a talent not to be wasted and squandered, but a talent to be used and improved; that they have much to do, and but little time to do it in. I want to see minutes more valued than hours now are. Life is a race, and, all else equal, the best training will make the best man, and secure the best place; and I know well that the idle brain is, most surely, the devil's best workshop. What, then, is to be done? Is it not desirable to adopt some course? Is it not necessary to act? Is it not essential to induce young men to cultivate habits of self-culture and of self-devlopment? It is most necessary—most desirable; and it is a positive duty, on our part, to act to ensure it. What man was ever a man worth calling a man without such self-culture? Rely upon it, such is the upward educational movement that we positively cannot stand still. I even see it imperative upon us that we combine to co-operate; and as every agricultural society in England looks to the Royal Agricultural Society as its agricultural father, it is for us to take steps to induce our parent to act for the better education of her agricultural children. I believe farmers' clubs generally, and every agricultural society throughout the kingdom, would gladly combine to facilitate such a movement; and I know of no course so effectual as the establishment of a public board of Agricultural Examiners. I strongly recommend two examinations: one for junior candidates not exceeding sixteen years of age, (as before alluded to,) and one for senior candidates not exceeding twenty-one years of age. I would certainly throw the examinations open to all candidates, as the only object would be to excite competition; and to grant an agricultural diploma to those competitors having attained to the necessary standard of intellectual acquirement. It could be a matter of no moment whether the knowledge of the senior candidates was attained by study in the privacy of their own homes, or by attending a course of agricultural lectures. It would be for the board of examiners to recommend the best works extant upon the various subjects and sciences for examination in the senior class; and it is highly necessary so to act as to ensure general competition. The standard of merit may not be set too high. Even the young man missing his mark and losing his diploma would in reality be a gainer—and a very great gainer, notwithstanding—from the habits of study and of mental discipline to which he had cultured himself in his attempts to secure the distinction of the diploma. I am well aware that such a board of examiners would have been of essential service to me; for though I continued to study chemistry, geology, and some other sciences, after leaving school, without the slightest incitation from those around me, yet I feel that the fact of a public examination would have been a sufficient inducement for me to have worked with redoubled diligence, preventing a foolish waste of time, training me in habits of mental and physical industry, and resulting in redoubled success. I do not think the middle-class Oxford University examinations meet our requirements; the whole matter will be far better in our own hands; the whole scheme may be self-supporting. We must carefully avoid the error into which the Highland and Agricultural Society of Scotland has fallen. That society required candidates to attend, for a period of two years, classes in five or six of the different sciences prior to examination. Such a requirement, of course, nullified the general usefulness of the scheme. The mistake is now rectified. In England or Scotland it must take a time for the competition to be great, or for the attendance to be large at the examinations, from the simple fact that the education of young men has been grossly neglected, especially after leaving school; and it must take a time to rear any number of young men, intellectually cultured and qualified to come forward for examination, or to compete, for the honours of the certificate or diploma. With the existence of such a board of examiners, how far more powerfully could a parent stimulate his son to do his utmost, and to how much better account could the present system of agricultural pupilage be turned! In my own case, it would afford me pleasure to use my most strenuous exertions so to assist those gentlemen, at any future time resident with me, in their studies and preparation for examination, that they should pass with credit and *éclat*. How far more gratifying, too, to parents and friends, to see each hour both usefully and profitably employed, instead of having to contend with the natural fireside habits of indolence, with habits of late rising, with general frivolity, and a thorough indifference to mental culture and business proficiency! Seeing the vast improvement, the complete revolution, which the Royal Agricultural Society has effected in agricultural mechanics, in agricultural machinery, in the breeding and development of stock, and in agriculture generally, I think I am not too sanguine in expecting the same improvement and the same beneficial result when that society turns its powerful influence to the mental development and the scientific culture of the agriculturist himself. There is an ample and wide field for action; and it is my conviction that in carrying out the system of agricultural educational examinations, lies hid in embryo the Royal Agricultural Society's most successful operations and her proudest triumphs. Having completed the educational portion of my subject, I will now turn to consider the discipline, and afterwards the introduction of the young man to life. I am anxious at once to establish the masculine fact, that every man is the architect of his own fortune, and the carver of his own future. There is no such thing as undeserved success or unmerited failure. A man may sink or swim according to his ability in the battle or struggle of life. Whilst one man succumbs to circumstance, and becomes the creature of circumstance, another yokes circumstance to his car, and triumphs over his position, winning increased distinction from the magnitude of the difficulties surmounted. I am extremely desirous to be clear on this point. I want to put aside all the maudlin enervating doctrines of chance and misfortune. I want to establish a habit of real self-reliance. I want young men to see that they had far better trust to their own internal strength and competency, than to any extraneous aid. How many a young man has been ruined by his reliance on fortune! How many a young man has been spoiled and rendered unfit for success in life by his expectancies! Fortune at best is proclaimed a fickle goddess; and though bachelor uncles and maiden aunts are all very well, they are certainly crochety beings, difficult to please and easy to offend; and I had rather rely, ten thousand times over, upon the strength of my own right arm and upon my own internal power, than to trust to the whims, caprices, and uncertainties of succeeding to dead men's shoes. Windfalls are always very acceptable, but they are broken reeds to trust to. Self-reliance is the qualification for success; and I am convinced, if we are men of observation, of thought, of industry, of perseverance, of principle and prudence, we must succeed in life, we must triumph, we must conquer. It is a moral certainty. No circumstance and no material power can prevent it. What is failure but industry unapplied or misapplied? or the fruits of labour undervalued and unhusbanded? In any case, trace the cause of unsuccess. What is it but a lack of the elements necessary for success? what but a lack of prudence, of principle, of energy, of industry, or ability? I do not deny the existence of heavy overwhelming losses; but even these are usually traceable to the facts of hazardous speculations or imprudent outlays, and to the adoption of the man-or-the-mouse principle of sink or swim. In the common course of matters, I am tired to the heart at the sound of misfortune: it is a lulling misnomer for human neglect and human incapacity. Many a man may say, "How could I avert my misfortune?" I reply, such misfortunes are usually traceable to habits of early neglect in education or in training, and to the effect of neglected opportunities. How is it the members of a large family usually succeed in life far better than an only son? What is it but the effect of discipline, habit and culture? The many are early taught to cut their own way, trained in diligence, to habits of care, economy, and hardihood, and reared upon the necessaries, and not upon the luxuries and supernumeraries of life—trained to produce, and not to squander; to save, and not to spend; whilst the only child learns the consuming to perfection, but not the producing; to spend, but not to spare or to save. What is it but the one cultured to succeed, and the other cultured to failure in life? But what is this enigma—success in life—of which we hear so much? What is it, but the power to produce exceeding the desire to consume?—what, but the balance after deducting the actual consumption from the actual production? Unfortunately in our day, so strong is the love of appearance, so great the appreciation of comfort, that men forget the great secret of life is not so much in getting as in retaining—not so much in producing as in not spending. Unfortunately, spending is the order of the day; there is a false show abroad; but all men of sound sense will be content to walk if they cannot afford to ride, and to walk before they attempt to run. How many young men appear to suppose that life is governed by "luck," and that success is a mere toss-up matter of chance! Success is as much governed by fixed laws as the solar system, with this saving clause of exemption—that no rule is without an exception. You see, gentlemen, I lay especial stress upon habits, and especially upon the habits of self-reliance. I look to education to teach a man to use his brains, his eyes, and his ears, to show he has a head upon his shoulders, and to prove he does not pass through life half asleep; but I look to habits and discipline to effect much also. We are a bundle of habits; and if any young man thinks he will succeed in the daily life of agriculture by informing his mind alone, he will find himself mistaken. For success there must be habits of industry and not of sloth, of prudence and not of prodigality. But to enter more minutely, most strongly do I recommend every young man to adopt the habit of early rising; to carry out the habit of thinking nothing of trouble in business; to adopt active habits, and an active and prompt execution of every duty. Most thoroughly do I recommend the habit of correct accounts, and of noting down passing business events. I strongly urge that interest and advantage be studied, and not inclination and pleasure—habits of self-denial, and not habits of self-indulgence. Settle it down as a fact that you can do anything if you try, and cultivate the habit of perseverance. Men succeed by sticking. Cultivate the habits of cheerfulness. Bears with sore heads don't make friends. Cultivate the habit of a frank, open-hearted, manly manner, combined with politeness; for conceited borishness and pedantry don't assist to success. I strongly recommend young men also to the habit of manual labour, sufficient to understand what labour really is, and to acquire a practical knowledge of the different operations of the farm. I think it well that young men should bear the yoke in their youth, and I give it as my experience that such a practical acquaintance with labour proves of infinite service throughout life. It is a splendid thing to be trained to labour, both mentally and bodily; also to spend with caution, and to act with care. Much more could I say upon habit—upon the habit of thought, the habit of observation, and the like—but I trust we shall hear no more the common cry of "what can I do?" or "I have no chance." Every young man with health and strength may succeed in life if he will; but his success must be the fruit of education, training, and discipline: and if he neglects these necessary means to an end, he will probably go by the wall. I don't call being born with a silver spoon in one's mouth success; and I don't call living on the leavings of a parent or a friend success. But I call that success which is earned by industry, ability, tact, and perseverance; and I had rather have the chances of many a man without a sixpence in the world, possessing these qualifications, than I would the chances of another reared to nonentity and in habits of extravagance, though possessing thousands of pounds. Young men of England, look to it that your education is right, your training right, your own self-culture right; and with such a commencement success in the battle of life is more than half ensured or secured. Above all, rely upon yourselves, cultivate the quiet assurance you can overcome every obstacle, that you are equal to every emergency; but see that the result equals your convictions, or conceit will prove your shame instead of competency your praise. We speak of patronage; but who can patronize a fool? We speak of friends; but who, in a business point of view, can befriend the incompetent? The world will look to worth and ability; and in every case it is upon men so qualified the world bestows its premiums. Who has a situation to offer, and does not look about him for the best man? Who has a farm to let, and does not search for the best tenant? The world, from self-interested motives, will befriend the competent, while it throws men of incapacity to the dogs. And who does not know that there are more good situations in life than men qualified to fill them, and more good opportunities than men qualified to embrace them? I make the allusion with extreme diffidence; but in my own case, gentlemen, I have known what it is to start in life without two ten-pound notes in my pocket to keep each other company. I have known what it is to fight my way in the world; and though I have had many a kind friend to whom to be grateful, I have had a taste of the disadvantages and the difficulties of life. They are excellent discipline; and to show young men there is something in self-reliance, I tell them plainly I would start again to-morrow without a sixpence in my purse, without a murmur and without regret. Further, to show the power of self-reliance, I know young men who were so reduced in circumstances by the depression consequent upon the repeal of the corn-laws, that they seriously contemplated an assignment of their affairs into their creditors' hands; yet these very men, by dint of courage, tact, and perseverance, though possessing at that time scarce a pound they could call their own, yet these very men have so pushed out hither and thither, have so doubled their resources, and redoubled their exertions, that they have now thousands of pounds instead of a few pence, with which to bless themselves. What others have done others may do; but young men must remember "life is earnest, life is real;" and they must learn to trust to their own strength, to labour, and to wait. I have spoken upon the education of boys at school, of the education of young men, and the discipline of habit after leaving school, and I now come to the last portion of my subject, viz., the introduction of the young farmer to life—his commencement in business. I am no advocate for young men sticking at home and being tied to their mother's apron-strings; but, as soon as qualified by stability of character and soundness of judgment—and the sooner qualified the better—let them commence business on their own account. By all means have them do something in some way to advance their own individual interests. If young men commence with capital, let it be with a moderate amount, barely equal to their actual requirements, for a superfluity of the needful never teaches the real value of money—and to teach the worth of the one pound sterling is highly essential in the opening of life. A few judicious monetary difficulties, in cutting one's way and in making ends meet, will do a young man no harm; difficulties are excellent tutors of calculation and careful outlay; whilst the necessity for industry compels to exertion, and prevents many a foolish extravagance. If parents are so situated that they cannot afford to give their sons capital, it is doubly essential a father should early insist upon a son turning out in the world, and working his own way. If there is no capital in the purse, there ought at least to be capital in the head, and young men of character, even in this competitive age, may succeed by trying. But young men must try: they cannot succeed by inaction. There is nothing like working one's own resources, and having individual responsibility for progress. In the matter of a farm there is a great deal in a good start. If a young man wants a business so much or wants a cage for a lady-bird so badly that he is induced to pay a rental for a farm exceeding by 10 or 20 per cent. its annual value, he has no one to blame but himself. If a young man lays out his money in permanent improvements, upon bad security, or upon no security at all, he has no one to blame but himself. Rotten props will let down men as well as buildings. I see great mistakes are made in attempting too large a business upon inadequate means. Now, though it is all very fine to be thought a great man in a small way, yet it is most undesirable to half-stock and half-farm any land. I do not object to a young man borrowing a small proportion of his capital at a reasonable rate of interest, but I know of no greater folly than attempting to farm 500 acres of land with capital barely sufficient for 300 acres. For profit and comfort there must be sufficient capital. Of course, let every young man secure good land, good buildings, and a good landlord, with a principled agent, if he can; but if he cannot, if the supply is not equal to the demand, by all means let him make the best of those persons and things with whom and with which he has to deal. I recommend every young man to take the judgment of an experienced friend upon every point upon entering business, not only in the hire of the farm, but also in the purchase of the necessary stock and implements. I have seen many a young man, without much judgment or discretion, much imposed upon both at auctions and in private purchases. In the management of the farm do everything well and at the cheapest cost, and don't be afraid to calculate the cost to produce a crop, or the cost to rear or fatten an animal. I am sure we look at a farm too much in the mass, instead of calculating the items, whereby we unknowingly lose in one or more departments of our manufacture, for the want of investigation. Scrutiny leads to judicious and profitable outlay. Cultivate a thorough judgment of stock, for purchases 10 per cent. too dear and sales 10 per cent. too cheap are serious mistakes, and tell heavily against success in life. Young men must know by observation what constitutes a day's work: horses are expensive machinery, and if horses are kept well and worked 20 per cent. daily below par, whereby 20 per cent. of horse muscle is necessarily kept beyond the actual requirements of the farm, I say these again are serious losses. The manual labour, too, of a farm is necessarily a heavy outlay, and a master receiving 20 per cent. minus his due in labour is in an unfavourable position. Young masters must learn what constitutes a fair day's work for a fair day's wages, and see, too, that they get it. Also, in task work, a young man may be much imposed upon by paying a heavy percentage beyond the value of the work performed. Both horses and men demand serious attention and consideration, with good supervision and direction. The work of the farm should always be forward, that it may be performed at the proper time and season. Not to make hay when the sun shines is mistaken economy. A man always just behindhand is not likely to overtake success. I most strongly recommend every young man annually to draw out a correct valuation of the live and dead stock, and of the covenants of the farm. I do it each year at October, and at the same time I draw out an actual balance-sheet of the annual returns and expenditure; and I urge upon every young man the necessity of doing the same. The more we are men of figures the more shall we be men of sound judgment, of deep research, and correct practice. Groping on in the dark has been the ruin of many a man. It is investigation which prevents a continuance in losses; and it is always wise to know the worst, and meet our difficulties, not by avoiding them, but by research, by action, and as men. I feel it to be absolutely essential for every young farmer to study the agricultural literature of the day. The Royal Agricultural Society's Journal must be carefully read, also the "Farmer's Magazine;" and it is highly important weekly to peruse the *Mark Lane Express* or *Bell's Weekly Messenger*, or some other good agricultural paper that young men may keep pace with the practical and intellectual progress of the age. Again, the Royal Agricultural Society's shows, and the other important and local agricultural exhibitions, are excellent opportunities for comparison, information, and improvement. To see other than home systems of farming is decidedly necessary to prevent local prejudices and those narrow notions which grow up under the shade of one's own barn-doors. I might say much upon the necessary amount of capital according to the character of the farm; also in recommending thorough draining, deep cultivation, autumnal fallowing, good stock, good manure, no false economy, and the like; but, in concluding my observations, I prefer to address a few remarks to young men themselves upon their own individual position and bearing. We cannot be blind to the fact that some men, upon their first start in life, make grand mistakes: they start with false views and false aims, and attain to a false position. In these days of ready credit, how many a man expends far beyond the limit which his income prescribes or warrants, in personal comfort or external show, in handsome furniture and house decoration, in first-class dog-carts, and other extravagances! Nor is this the worst: such a man usually resolves to cut a shine, be a swell, drive fast horses, attend balls, hunt, shoot, smoke and drink, give dinner parties, ape superiors, and usually comes to grief. This is not a picture of plodding industry, and I have drawn an extreme case of folly, to warn young men without adequate means against such a life of tomfoolery. Success is based upon labour; and a slow, unpretending, economical start in life is a safe start. Let young men be content to earn their position and their luxuries before they assume the one or indulge in the other, or they will find to their cost that they end their life as they should have commenced it—in labour instead of competency, and that a life of youthful extravagance leads to necessitous old age. Youth is not the time for self-indulgence and the jog-trot easy pace of indolence. Youth is the time for hard but substantial fare, hard every-day lodging and hard work. I am opposed *in toto* to the smoking, drinking, and pampering habits of young men in the present age. I am equally opposed to all the easy-chair habits and the semi-inaction far too common. As a young man I can knock on very well in life without much of the stimulants—beer, wine, and spirits, and without the enervating influence of tobacco and many other luxuries; and, what is more, I find myself better in health, better qualified for business, and better in pocket, without them. I am an advocate for moderation in everything; and I think it a strange thing indeed if a young man is not at liberty to decline to injure his health or his constitution because of the voice of public opinion. I especially urge moderation, as I observe young men make fools of themselves in their hours of excitement. I observe in the hour of excess deeds committed which entail an afterpiece of sorrow and regret; and how often the loss of character, of business, habits, and of fortune may be traced to a wrong step here—to a departure from habits of temperance! I am no ascetic: I can be as happy as any man in spirit; but I do not need either a narcotic nor an opiate to lull or to cheer me, and I am not prepared to fall down to that public opinion which makes venial the seed-bed of vice. Intemperance is the source of more than one-half of England's sorrows; and I warn the rising generation to flee her enticing calls. Safety here, and a young man of sense is proof against the foolish spree, secure from a youth-time of folly, and an old age of physical debility and mental repining. Some young men appear to consider the fast life a life of heroism, and a life wherein to glory. It leads to a life-time of shame; and how is society strewed with the wrecks of youthful intemperance, vice, and folly! No Scriptural axiom is more true than the one embodying the fact, "That the world will speak well of thee so long as thou doest well unto thyself." I have said much upon temperance as a preventive to folly; but the only true safeguard is true Christian principle. Christianity is the fundamental basis of security; and shall I, who feel that I owe all that I have, all I am, and all I ever shall be, to its influence—I say, shall I lack the moral courage to assert its power? Shall I pass it by as a subject which has nothing to do with the business of life? Shall I bow to the popular notion afloat in the world, that it is only fit for Sundays, and for elders when the fire of life has abated? Shall I admit that it has nothing to do with the discipline and the success of life? I came to tell you my experience; and, as a young man, I tell the young men of England plainly, I have found Christian principle as a thousand-horse power within a man, to cheer and to urge him onward in the path of duty. I hate the hypocritical cant and the jesuitical humbug which abounds. There always will be inpostors in any age; but I know of no body of young men more imposed upon than those who wilfully determine to have nothing to do with true Christian principle upon any terms. True Christian principle is the highway to success in life; for while it prevents indolence, sloth, and extravagance, a waste of time and a waste of money, it excites to industry and economy, to uprightness of character, and rectitude of conduct. Are not those thus imbued—the men who prove Havelocks in their sphere?—men armed with moderation, patience, and endurance—men possessing promptitude and perseverance? Are not those the men who neither rack their bodies by excesses, or their minds by fear and feverish anxiety? Are not those the men intellectually strong in tranquility, and physically strong from temperance? Are not those the men who are kind-hearted, courteous, considerate, and unpretending? Are not those the men who can control their tempers and their passions, and live above the jealousies, animosities and envies which mar the happiness and peace of most men? They are; and, if such are the fruits of true Christian principle, are not such qualities and such fruits the essentials for success in life? Are they not the essentials to secure a peaceful and a happy home? Are they not the essentials to constitute a cheerful and a happy manhood? They are; and to every young man I recommend the Bible as his chart, and, when Christian precept has become his practice, may it be his good fortune to possess a sharer of his joys, to possess a helpmeet, amiable in temper and kind in disposition; to possess a wife adorned with the ornament of a meek and quiet spirit, adorned with the beauty of love and the jewel of sense; and thus may they be mutually blessed, and prove blessings to all around them. In conclusion, a good education, thorough training and discipline, are the groundworks of success in life. Agriculturally those groundworks have been and are at the present time, much neglected; and, though parental and social influence generally may do much to mould the character of youth, yet it is only by national combination and national exertion that the intellectual development, the scientific culture, and the mental discipline of the agricultural youths of England can be secured. And most strongly do I urge upon you, gentlemen, upon parents generally, and upon the kingdom at large, the necessity for action, the necessity for a well-developed plan of agricultural educational examinations; and such public examinations, I am convinced, would prevent the present waste of thousands of pounds annually in indolent and wrongly-directed efforts of instruction, and at the same time put aside the present incalculable loss of many of the most precious years of a young man's existence, extending from the age of sixteen to twenty-one years—a loss, too, which cannot be estimated even by tens of thousands of pounds annually. And I long to see England made more great, more glorious, and more free by the improved intellectual culture and the improved mental discipline of the rising and future generations of Englishmen.

Ventilating Hats.

A great number of hard-shell hats are made with a small opening covered with gauze in the crown of each, and with this arrangement it is supposed they afford ventilation for the head, and tend to keep it cool during warm weather. This is a mistake, because ventilation can only be effected by a current of air, and as there are no means provided for the inlet of air, but only for its outlet, in such hats, of course they cannot afford ventilation. The true ventilating hat must have perforations at or near the band to secure the inward passage of air, and quite a number of such hats are now manufactured and worn. Felt hats, being somewhat porous in their texture, afford partial ventilation. Silk plush hats being saturated with lac-varnish are perfectly impervious to the atmosphere.

Scientific American.

Do everything in its proper time. Keep everything in its proper place. Always mend clothes before washing.

Rising early is an excellent habit.

The Effects of High Prices of Slaves; *Considered in reference to the Interests of Agriculture, of Individuals, and of the Commonwealth of Virginia.*

In regard to every undertaking, or pursuit of business, requiring capital for the prosecution, it would be admitted, as a general proposition, that the less the price or value of the stock or capital required, from which to obtain equal amounts of products, the greater would be the net profit of the business, and of every investment therein made.

But though this truth, stated in general terms, would be universally admitted, and without question or doubt, still it would be excepted to by many, if not by most persons in Virginia, as to the especially important subject of agricultural industry and investments. For such exception and denial are necessarily implied in the opinion commonly entertained, that the high prices of lands, and of slaves, are evidences of the prosperous condition of agricultural interests, and of agriculturists, in the localities where such prices prevail.

Land, and the labor required for its culture, constitute the greater proportion of all agricultural capital employed. Greatly expensive as these are, land and labor (and in Virginia it is mainly slave-labor), are but the most important of the materials and tools essential to the carrying on of the mechanical operations of tillage, and what may be considered as the manufacturing of the products of agriculture. To whomsoever may be about to invest capital, or to enlarge his previous amount of investment in the business of agriculture, the less the price at which he can purchase land and slaves (they being nearly all the capital required), the greater will be his profits in the production of like amounts of crops, if sold at equal prices. If a certain farm, with a certain number and description of slaves were bought at fifteen thousand dollars, and would yield annual crops for sale of the market value of four thousand dollars, it is obvious that the agricultural net profit, would be very far greater than it would have been if the same property had cost, and was worth in market price forty thousand dollars.

The error of opinion, which is so common on this subject, is the result of mistaking effects for causes. The increased price of land is generally a true indication of a *preceding* improving, prosperous, and profitable condition of agriculture in that locality But a preceding increase of price is not evidence of either still improving, continuous, or prospective profitable returns of agriculture, upon the then increased price of land and cost of capital.

The greatly increased prices of slaves do not (as in regard to lands) even offer evidence that their preceding profits have justified the advance of price, but only that the profits of slave labor in *some* locality have been and still are great; for slaves, being moveable, will be rated in price, not by their profits in their actual location, but according to the profits in any other region to which they can be easily transferred. Thus it might be, that while the profits of grain tillage and of agriculture generally, in Virginia, would yield the least profit, the prices of slaves and also their profits might be at the highest rate, on the cotton and sugar-lands of the more Southern States.

In the last twenty to thirty years, both agricultural improvement and profits have made great advances in Virginia. Mainly in consequence of improvements in fertility and productiveness, the prices of land have greatly advanced. Let us suppose that this advance of price, on the general average, to be equal to forty per cent. (On particular farms it has been full two hundred per cent.) If the increase of net profit is advanced (by the improvement of the land) in equal proportion to its market price, the land is now as well worth one hundred and forty to a present buyer, as it had been at first worth one hundred to the former owner and first improver. Indeed, it may be worth much more, if additional future improvements are still in certain prospect, from which additional products and still greater profits may be hereafter realized. And so far as such prospective improvements enter into consideration, and make part of a present valuation, it may be conceded that the increased price may also be evidence of future greater value, as well as of preceding and present good products and profits. When such new and permanent improvement, and a certain income therefrom, have been made manifest, it may be a safer, and therefore a better investment, to buy land at the latest and highest price, than it had been at the early low price before the improvements of fertility had been made, and when their feasibility was doubtful or totally unknown. Nevertheless, it is not the less true, that the first improvers who raised the lands from the lowest to the highest production and actual value, derived more profit during the process and progress of that imprvement that they or their successors could do at the later time of highest value and price, and maximum production of the lands. Further: the first term during which the lands rose (by their improved production) from a low to a high market price, must have presented a more prosperous and more profitable condition of agriculture, than when, after the completion of their improvement, the lands had reached their highest state of production and of price.

No farmer can afford, or will long endure, to cultivate land on which his agricultural and other products regularly fall short of yielding a fair and ordinary interest or profit, on his whole capital so employed. Negligence of calculation, and ignorance of the amount of loss, may cause many particular and temporary exceptions. But as a general rule, men will not invest capital, nor continuous previous investments, in pursuits which do not yield the ordinary safe profits of capital. Therefore, if such reduction of profits shall occur in Virginia, the first effect will be to deter persons, as new undertakers, from investing capital in agriculture; and this will so far lessen the demand of purchasers, and increase the supply of land offered for sale beyond the effective demand, that the price of land must fall, as a certain consequence. So would the price of our slaves decline, for the same reason, if they were fixed to the farm, or to Virginia. But as their market price is regulated entirely by the demand and higher appreciation in the more Southern States, there will be no reduction of their selling value, for removal, because of the lower value of their labor at home only.

In another aspect we may see the same conclusion reached. The capital of the farmer in Virginia is made up mainly of land and slaves. Of this compound amount, the necessary slaves constitute a large proportion, and in many cases the larger proportion, of the whole mixed investment of capital. Considered merely as the necessary total investment in farming stock, and while yielding good profits on the whole amount, it matters not to the farmer how much value of his mixed capital is of land, and how much of slaves. It is only necessary to him that the two together shall yield good and sufficient products and profits on their united and total amount. In the last fifteen years the price of slaves has risen full 100 per cent. This increase of their price has not been caused by the actual increase of the value of their labor and their products at home, but by the higher value and greater demand for them abroad. Excepting, therefore, the few cases in which improved fertility and net products of farms have been increased in equal proportion with the doubled market price of slaves, no new undertaker could afford to buy slaves for investment in agriculture in Virginia, without some countervailing reduction of cost in the other necessary capital stock. And such reduction can only be found, or made, in the land—and this operation (which is already begun and in progress) will necessarily follow and increase with the supply of land for sale exceeding the demand of new purchasers. So far as the prices for slaves have already exceeded the profits of their labor in Virginia, so far that excess has already checked the demand for investments in agriculture, and must operate to reduce the price of land. And the more that the price of slaves shall rise, still more, and in full proportion, will it operate further to reduce the price of land, and to throw land out of cultvation (or to render its cultivation more imperfect), because of the loss (by their removal to the South) of the slaves needed for cultivation in Virginia, and which are even now very deficient in number.

Probably but few owners of slaves have voluntarily sold them merely on the consideration that it would be more profitable to sell than retain them as laborers, and as agricultural capital. But whether the recourse to sale is sought or avoided, by the present owners, the end will be the same, in more or less time. At the present high prices of slaves, no undertakers can afford to make new and complete agricultural investments. No such case has occured within my knowledge or information, for the last two years. It is only in cases of already established and successful farmers who, needing more slaves than they before owned, may buy a few more to supply great deficiencies of labor, and to prevent great consequent losses. But even such men as these do not, and cannot profitably, buy half so many additional slaves as they greatly need for their labor, and as they would buy, if at much lower prices. Consequently, though the general *home want* for labor is greater than would be supplied by all the natural increase of numbers of our slaves, the *home market demand* is almost nothing, compared to the effective *Southern demand* for our slaves. Thus, whenever debt, or necessity, or the legal division of slaves among heirs, compels the sale of slaves, nearly all sold must be sent abroad. It is supposed that the annual draft and deportation thus made on our stock, already exceed in number all the increase in slaves in Virginia by procreation. This loss must continually increase with the potency of the producing causes, and with increasing rapidity; and sooner or later the operation must remove so many of our slaves, as necessarily to destroy the institution of negro slavery within the limits of Virginia. Every successive step of approach to this end will be more and more calamitous to the economical, social, and political interests of this commonwealth; and the complete consummation will be one of the greatest of evils to the whole of the Southern States, of which, as yet, Virginia forms an integral part in sentiment, interest, and in institutions and policy.

Some persons, even in Virginia, and at this late day, would deny that there would be these or any general evils produced by the extinction of slavery in Virginia, by this operation of gradual sale and deportation. To the holders of such opinions, or any others of the anti-slavery school, I shall not oppose a word of argument. There are also many other persons who deem that the highest price for slaves is always beneficial to the owners, and that any injury from their sale abroad, at such high prices, if in numbers short of the annual increase, will be more than counterbalanced by the large sums thus received by the sellers, and added to the general wealth of the community. Treating this merely as a question of values or of economy, I will estimate nothing on the score of feeling and humanity, and the disruption of all the ties that must be caused by this general, though gradual and long-continuing deportation of all the slave population of Virginia. But considering the question merely as to values, and without descending to details, I maintain that no possible increase of market price, or of pecuniary profit to the seller in each particular case of the sale of slaves, can compensate the commonwealth for the enormous accompanying evils, even if these evils were merely social and political. But to reach the end —of the removal of all slaves and of negro slavery—which some few of our distinguished politicians and political editors even now look forward to as a benefit—our people and commonwealth must first pass through various other conditions of loss and calamity—the gradual deprivation of necessary agricultural labor—lands reduced more and more in price, deprived of necessary means for fertilization, badly tilled, and much even thrown out of cultivation—the emigration of numerous slaveholders and agriculturists, and of the wealthier and most industrious of our people, because agricultural capital in Virginia could no longer yield profit—and the general deterioration, social, moral, and intellectual, of the remaining diminished population of the State. Even the later supply and substitution of a laboring class of foreigners and Yankees to make up a new population (which is the great compensatory benefit expected and promised by anti-slavery theoretical reasoners), could not be made way for, nor effectively invited, except by the prior nearly complete removal of slave labor, and the consequent lowest prostration of prices of the lands and of the prosperity of the still existing remnant of the original population. When a descent shall have been thus made, and every former property-holder has been either driven away, or ruined if remaining, it is true that a new colonizing of the desolate and wasted territory might and would be effected, and of materials which it is one of the important benefits of our present institution of negro slavery to keep away and to defend us from. I will not attempt, by any opposing argument, to lessen the satisfaction of those persons who can imagine a recompense for thus destroying the present population and commonwealth of Virginia, in the prospective establishment, after a century of calamity and desolation, of a Yankee community on the territory of Virginia. It is not to such reasoners that my remarks are addressed, but to those who, like myself, deem the existing institution of negro slavery to be one of our chief blessings, and that its removal, by any means whatever, would be an unmixed evil and a curse to the whole community.

So far, reference has been made only (or mainly) to general interests and results. Let us now consider the subject in its bearing on private or individual interests.

Even if the commonwealth should suffer ever so much in the loss of agricultural labor, in the gradual decline and eventual prostration of the price of lands, in the emigration of its best and most wealthy population, in the consequent drying up of the sources of public revenue, and so destroying public credit if not also State solvency, in starving out education, stifling refinement of manners, and lowering social character and intellectual station—still it would be conceded by most persons, that individual slave-owners at least are profited by the existing high prices, and will be still more profited by any further increase of the foreign demand for, and sale, and exportation of slaves. This may be true in many particular cases, if we look solely to the immediate interest and gain of the individual seller, and to that particular transaction and time only. It may be true, and permanently, in many more cases, if the individual seller (by early emigration or otherwise) shall escape being involved in the later and consequent ruin of his country. But all such cases will form but a few exceptions to the general rule, that the greatest (supposed) private gains of individual sellers of slaves at highest prices, will be more than counterbalanced in their own shares of the remote loss and damage inflicted on the community by the whole system of extensive sale and deportation of slaves. And putting aside the effects on the general interests of the commonwealth, the greatest amount of gain produced by the high prices of slaves to their individual owners are not so great as the amount of disadvantage and loss, produced by that same cause, to the interests of a much greater number of other individuals and members of the same community.

The individuals who are benefited by obtaining prices for slaves too great to be afforded by any persons who would desire to buy here, are those only who choose or are compelled to sell slaves. There are almost no slaveholders and farmers who, of their own choice, would, by selling some of their slaves, lessen their amount of labor, which is already deficient on almost every farm. They who thus make partial sales are very generally such as are compelled to sell because of improvidence, bad management, and consequent debt, or other great necessity. No persons look forward to sell, and so to profit by the existing or prospective high prices of slaves, except those who also expect to be compelled by debt; and these are fewer, by many, than the number who will be actually so compelled at later times. Then it is only the few persons who expect to be compelled to sell slaves who also can expect to obtain any pecuniary gain from the highest price of slaves. To all other persons, more than ten-fold in number, high price is either of no operation, good or bad, or it is an injury and an obstacle to prevent their obtaining greater pecuniary gain by employing more slave labor. To the farmer and slaveholder of ordinary and average industry and thirft, whose other means and extent of labor increase as his slaves increase by procreation and growth, who neither desires nor expects to sell or to buy slaves, but only to bequeath those which he possesses and their increase to his children—it is clear that such a person neither gains nor loses by high, nor would lose by a low market price for slaves. They are worth to him the actual value of the net products of their labor (which he cannot dispense with), and there is no difference to his income or interests whether his best slaves would sell for fifteen hundred dollars, or for but five hundred dollars. If a man so situated sells a vicious slave, he will need to fill his vacant place by the purchase of one more suitable, and still there will be neither gain nor loss in the rate of price, whether both are high or both are low, in the sale and purchase.

But besides these two classes of farmers and slaveholders, there is another, the members of which are the most industrious, thriving, and of most utility and benefit to their country. These, by the continued extending of their agricultural improvements and labors, need more slaves than they possess, and yet cannot afford to buy them because of their exorbitant prices. If to be bought at lower and remunerating prices, these men alone would buy as many slaves as would be sold by all the improvident and necessitous owners, and thus there would be retained to the commonwealth, and transferred to the most profitable service, all the labor that is now lost and is so greatly needed. There are now in Virginia, even of those already slaveholders, ten men of this most useful class, who would be glad to buy and employ more slaves, where there is one of the indebted or improvident class who is compelled to sell. And more slaves are needed, and would be bought and retained by residents, if at low prices, than are now sold and sent abroad to obtain the present high prices. To say nothing of higher considerations, and public or general interests, the benefit that would enure to individual buyers from greatly and permanently reduced prices for slaves, would be much greater than would thereby be lost in price to all the individuals who are sellers.

But even this is but a very contracted view and comparison of the private interests at stake—and of the balance of benefit that would accrue, first to private individuals, and through them to the community. The foregoing estimate and comparison of interests were limited to actual slave-owners. But the number of slave-owners would be greatly increased, (perhaps doubled,) if the prices of slaves were greatly reduced. It is not needed to set forth the advantages to the commonwealth, and to the slaveholding interest, of increasing the number of additional proprietors of slaves. And besides all such new recruits to the slaveholding interest, every other man in the commonwealth, who expected or hoped to be able to become a slaveholder at any future time, would deem his wishes and interest forwarded and served by such reduction of the market price of slaves, as would offer the only ground on which to rest his hopes.

But there are many persons who, even while admitting the truth of more or less (and even of the whole) of the positions here assumed, still will claim, as a great gain and profit, both private and public, to Virginia, the large amount of money received for the slaves annually sold and carried to the South. Suppose the number so removed, to be now at the rate of twenty thousand a year, and they being mostly of the more valuable classes, may be averaged at eight hundred dollars, making the total amount of purchase money sixteen millions of dollars a year. Whatever evils and sufferings may be incident to these sales, it is conceded by most persons, and scarcely denied by any, that the money thus received is, at least, so much profit to the sellers, and to the commonwealth, in the same manner as would be obtained from the sale of any other production of agriculture. This I deny. Such would indeed be true, if the slaves sold were all surplus, and not needed either for the service of their owners or the benefit of the commonwealth. But such is not the case, in any respect. Crops sold and exported are entirely surplus, and every dollar's worth sent away is so much gain to the individual producer and to the public interests. And any portion of such surplus, that was held back from sale (or as profitable use or consumption,) would be so much of waste and dead loss to the producer and to the country. Also of the grazing and fattening animals, which constitute the great agricultural products of the western portion of Virginia, the annual sales are strictly confined to the surplus animals, of which the removal does not detract from the present productive value, or the future increase of the numbers retained on each farm. It is an old calumny, often repeated in England and by Northern abolitionists, that negroes are bred and reared in these older Southern States for sale, and that the surplus individuals are annually selected for market, precisely in the same manner as a grazier selects his beasts for sale. If this charge were as entirely true as it is entirely false, however odious, abhorrent, and indefensible would be the practice, it yet might be truly claimed as being profitable to the full extent of the operation. For in that case only surplus and therefore useless slaves (at home) would be sold—and the number so abstracted could never encroach on the amount of slave labor required for the most profitable tillage of our State; and, therefore, if these motives and objects, and these only, operated to sell our slaves abroad, there would be now, and perhaps for many years to come, a complete cessation of all sales of slaves for exportation. For the proper tillage and improvement of our own lands, and other uses at home, now require, and could advantageously employ (if to be bought at fair prices,) every slave that is now sent out of the State. The actual sales are rarely induced because the slaves sold are surplus to the owners—and never because they are surplus to the commonwealth. It is the debt or necessity of the owners, that leaves to them no choice, but to sell some of their slaves—and it is their much greater value and price abroad which forbids other persons here from buying and retaining the slaves that are sold and carried away. And when such partial sales are compelled, the selected subjects for sale are not of the surplus, or the least useful individual slaves, but usually of the most efficient young laborers, of both sexes, because these will command the highest market prices. Further—the sales are not made by owners, or from farms, where slave labor is best supplied, and where any loss of hands would be least felt—but most generally where labor was previously very deficient, both to the land and to the owner.

Another view will serve more clearly to disprove the alleged pecuniary gain to the commonwealth from the sale of slaves. It is a fact, known to every man of observation and intelligence, that labor is greatly deficient in all Virginia, and especially in the rich western counties, which, for want of labor, scarcely yet yield in the proportion of one tenth of their capacity. There is scarcely a farm in Virginia on which more slave labor is not needed, and could not be profitably employed in the improvement and tillage of the fields. For large spaces, ten times the present number of slaves are required, and (if bought at low prices) could be advantageously employed, for both private and public interests. Under such circumstances, the removal of every slave from the State is not merely the loss of the value of the service or hire of such slave, but of all the amount of additional crop or other product that the labor of such slave would have made if retained, and which has not been made, because of his removal and the deficiency so caused of so much labor. A young negro man may now be hired for a year for $130 and his maintenance; and his labor, applied to all the other capital of a farm that needed his labor, would probably add not less than $300 to the net sales of products of the farm. If, then, this slave were removed from the State, and, of course, so much labor as he would have performed be omitted, the annual loss to the farm, and to the commonwealth, would not be merely $130, the market price of his hire, but the $300, the value of what would have been the net product of his year's labor. Again: Suppose that a farmer should be tempted by the offer of double prices, to sell all his working horses and other plough teams, though he would be unable to replace them for a year. It is obvious that his consequent loss would not be the fair value, or price of hire, of so many horses and other working teams for a year, but the whole of the crop which he would fail to make for want of all team-labor, and which would amount to very much more than either double or quadruple prices for the animals he sold. Now, the sale of every useful slave from Virginia is, in like manner, a loss to the commonwealth of all the net products of the labor of such slave if remaining. Such labor cannot be replaced for the State; and therefore the loss continues for all the time that the laborer, if retained, would have been useful. Four years, estimated at $300 of net products so lost, would amount to $1,200, or about the highest present price for young and able men. According to these views, the highest prices yet obtained from the foreign purchasers of our slaves have never left a profit to the State, or produced pecuniary benefit to general interests. And even if prices should still continue to increase, as there is good reason to expect, and to dread, until they reach $2,000 or more for the best laborers, or $1,200 for the general average of ages and sexes, these prices, though necessarily operating to remove every slave from Virginia, will still cause loss to agricultural and general interests, in every particular sale—and finally render the State a desert and a ruin.

R.

Hanover County, Virginia.

(From De Bow's Review.)

The following very spirited and interesting account was received, (we regret to say,) too late for our July number, but it will be none the less interesting to our readers in consequence of the unavoidable delay attending its publication.

There is no part of Virginia, we believe, where the spirit of improvement in stock-raising is in advance of the neighbourhood in which the exhibition referred to in Mr. Noland's communication occurred, and there is probably no one in that neighbourhood who has contributed more largely to the diffusion of that spirit than Richard H. Dulany, Esq., who, for years past, has been importing some of the finest specimens of the best breeds in England. The most perfect Ram of pure South Down blood we ever saw was exhibited by him two or three years since at the Fair of the Virginia State Agricultural Society:

For the Southern Planter.

Upperville Union Colt Club.

The annual exhibition of the "Upperville Union Colt Club," came off on the 16th instant. Upperville, you may probably know, is a village, beautifully situated among the green hills of Loudoun and Fauquier, just at the foot of the Blue Ridge and in a section equally noted for its fertility of soil and beauty of scenery. These lands left untilled for a few years, carpet themselves in rich turf, and are generally owned by men of wealth, who are enthusiastic agriculturists and stock raisers; so that there is not wanting rich pasturage, ample means, nor the spirit of enterprise necessary to improve to its highest degree of perfection, live stock of all kinds. The *hobby* of the country, however, is the *horse*, the love of which is a *passion* with this people. Any of these "sovereigns," like England's king on Bosworth field, would give "his kingdom for a horse." Old and young, rich and poor, white and black, have a "*ga-laugish*" look when in the saddle or handling the ribbons, and as a consequence, every thing with hair on it is made to move. In one family, particularly, it is thought by some that the children are *born with spurs* upon their heels, and all the colts come "natural pacers."

For many years past much attention has been bestowed on breeding *horses for the saddle*, and such a commingling of pure "riding blood" was never known in any other country. "Hiatoga," "Robroy," "Saltram," "Tom," and "Telegraph," hold place in the affections of the people, and each is as highly esteemed by his friends as if "all the blood of all the Howards" had coursed through his veins. The wonder is that the product of such moving crosses ever *stand still* long enough to get a saddle on. A very interesting confirmation of the theory that the "*acquired* traits of the progenitor transmitted to the offspring," is here found in the fact that many of these colts, before they are "bitted," excell in what we call the *artificial gaits*—rack, dog-trot, &c. (And let me tell you, by-the-way, that the "dog-trot" is the very perfection of a travelling gait. In it the greatest distance per day is accomplished, with little fatigue to horse or rider, and, if you want to feel like a business-man, a freeman and a gentleman, at one and the same time, just get a good dog-trotter and go ahead.)

Of late the attention of the horse-breeder of this section has been divided between the saddle and quick-draught horse, and the introduction of the Black Hawk, Messenger, Madison, Hunter, Cleveland and Moss Grey, strongly suggests the idea of "2.40," if only a level could be found among these hills on which to lay a "plank." This, however, is not the land of "fast" men nor fast horses, so that these colts will have to find their level elsewhere; but, if in light draught, you seek *high style, great beauty*, and *perfect grace*, here you find it in full perfection. I predict that the influence of this Colt Club will be impressed upon the character of the horse throughout the State, and that these shows will become marts for the sale of fine horses, at which every want may be supplied. There were upwards of eighty entries in the different classes, and the Club on this occasion distributed about $500 in premiums, consisting of beautifully wrought silver cups; and if merit could have been fully rewarded, double the amount would have been disposed of. I send you herewith a list of awards, and can but regret that circumstances will not admit of my calling attention to some of the unsuccessful competitors, who though losing the high prize, are yet well worthy of a commendatory notice.

First Premiums—$20 Cup.

Geo. S. Ayre—Heavy draught 1 year old stallion.

Jno. M. Scott—Heavy draught 2 year old stallion.

Jno. Grant—Heavy draught 2 year old gelding.

Joseph Jeffries—Heavy draught 3 year old stallion.

Rich'd E. DeButts—Heavy draught 3 year old filly.

N. Berkeley—Quick draught 1 year old stallion—Madison Hunter.

N. Berkeley—Quick draught 2 year old stallion—Madison Hunter.

Samuel Tebbs—Quick draught 2 year old filly—Black Hawk.

H. G. Dulany—Quick draught 3 year old stallion.

Rich'd H. Dulany—Quick draught 3 year old filly—Cleveland Bay.

J. Thos. Smith—Saddle, 1 year old stallion—Oregon.

Sam'l T. Ashby—Saddle, 2 year old stallion.

Thos. Foster—Saddle, 2 year old gelding—Tom.

Robt. Carter—Saddle, 3 year old stallion—Tom Telegraph.

Dr. J. Bushrod Rust—Saddle, 3 year old filly—Tom Telegraph.

Second Premiums—$15 Cup.

Sam'l Tebbs—Heavy draught 1 year old Scrivington colt.

Robt. Carter—Heavy draught 2 year old gelding.
Ashton Marshall—Heavy draught 3 year old Oregon filly.
Rich'd H. Dulany—Quick draught 1 year old Scrivington colt.
R. Welby Carter—Quick draught 2 year old Black Hawk colt.
Sam'l Tebbs—Quick draught 2 year old Black Hawk filly.
Caleb Rector—Quick draught 3 year old St. Lawrence colt.
A. C. Randolph—Quick draught 3 year old filly—(Gipsey).
F. Lewis Marshall—Saddle, 1 year old Oregon colt.
Dr. T. Eliason—Saddle, 2 year old colt.
J. Bushrod Rust—Saddle, 2 year old filly.
Col. Ham'l Rogers—Saddle, 3 year old Saltram colt.
Geo. S. Ayres—Saddle, 3 year old filly.

Among the old horses for which no premiums were offered, I noticed Mr. R. H. Dulany's splendid imported Cleveland bay, Scrivington—a horse of great power, and suited to all work—the Black Hawk horse of the same owner—the getter of more fine colts than any other on exhibition; a Messenger horse of Mr. R. Welby Carter, which gives great promise; Mr. Marshall's Oregon, a fine mover, and the getter of several of the premium colts; Mr. Nath'l Burrell's Moss Grey, which has about him all the points of a quick draught horse, and several others of merit.

The success of this enterprise will, I hope, induce the formation of similar clubs throughout the State, under the influence of which Virginia will become famous for her fine horses. Yours, R. W. N. N.

From Hunt's Merchants' Magazine.

Manufacture of Paper from Straw.

A German invention for treating straw so as to produce a pulp suitable for the economical manufacture of paper, is said to successfully meet the difficulties that have heretofore attended the process. The straw is first steeped entire for sixty hours, in spring, rain, or river water, of a temperature of from fifty-five to eighty-five degrees, according to the season of the year. After some hours, the water becomes gradually warm and discolored, and an active fermentation takes place. After sixty-hours, the liquid is suffered to run off, and the straw is washed with a plentiful supply of water, in order to remove all the soluble coloring matter. The straw is then drained, and while still damp is subjected to the action of millstones, rolling on a plane surface, or passed between a pair of rollers, in order to flatten the straw. It is then forced between other rollers furnished with cutters, or other suitable apparatus, whereby the straw is formed into filaments or fibres, as long and continuous as possible.

When thus reduced, the straw is exposed to the air and sun, for the purpose of drying it, after which process the straw will have assumed a pale yellow color. By subjecting the straw to the action of water, and subsequently exposing it to the air and light, it becomes bleached to a certain extent; but by means of a subsequent process, it is completely divested of all coloring matter, and is rendered perfectly white. After having been submitted to the process referred to, the straw is steeped for one or more days, according as it is in a more or less filamentous state, in one or more chemical preparations, the filaments being first treated either with the alkaline solutions, or by the solutions of hypochloride of soda or potash; and sometimes for a longer or shorter period, with the preparations of hypochloride of lime, until the straw has acquired the requisite degree of whiteness. By these processes the straw becomes reduced to beautiful filaments, which may readily be converted into pulp.

From Hunt's Merchants' Magazine.

Means of Preserving Timber.

Oils are preservatives of wood, as is evidenced in the case of whaling ships, which seem to be proof against decay. Hot oil has been experimented with in impregnating wood; but while it rendered it more durable, it injured the tenacity of the fibres. From the well known preservative nature of arsenic, it would be effectual for preserving timber, but its use is attended with much danger. Timber impregnated with a solution of tannin is rendered preservative, by the tannin combining with the albumen, and forming an insoluble compound, in the same manner that leather is produced by the combination of the tannin with the gelatin of skins. Creosote is an excellent preservative of wood, and the efficacy of common tar, for this purpose, is attributed to the creosote it contains. The boiling of timber in wood tar renders it highly preservative, but it impairs its strength. About two gallons of creosote to every one hundred gallons of water, makes a sufficiently strong solution for use. Burnett's process for preserving wood consists in the use of a chloride of zinc solution—one pound to every five gallons of water, and is applied in the same manner as the corrosive sublimate. For ship timber it is much superior to the corrosive sublimate, because the compound which it forms with the albumen of the wood is insoluble in salt water, which is not the case with the mercury compound. The chloride of zinc, and the sulphate of copper are the most simple, and the best preservatives, considering the cost. Shingles for roofs of houses, boiled in a solution of the sulphate of copper or pure salt, will last many years longer than they otherwise would.

From the New England Farmer.

Ornithology.

BY S. P. FOWLER.

The family of wrens in the United States and Territories is composed of 12 species, and includes the genus regulus, (crested wrens) and the Troglodytes or proper wrens. The only species I have observed in Danvers are the house wren, winter wren, marsh wren, golden-crested wren and ruby-crowned wren. The common house wren, (Sylvia Domestica of Wilson,) which I intend more particularly to notice, is the most numerous species found in Massachusetts. It has become completely domesticated, is never seen in our woods and forests, and seldom noticed far from the habitations of men. With the protection it everywhere receives, it is singular it is not found more abundantly, as it rears two broods of young in a season, and lays from six to nine eggs. Its habits are very peculiar and eccentric, possessing individuality in a high degree. It is never moved by a particle of gregarious emotions so common in birds; on the contrary, two pair of wrens can never endure each other's presence in a garden, a quarrel always taking place, and one of them is forced to quit the premises. Although quite a small specimen of ornithology, it is smart and courageous, petulant and imperious. It seldom fails to assault the peaceable blue-bird, when preparing to breed in the neighborhood, by visiting its nest in the owner's absence, and committing outrages, of which one would suppose such little birds would not be found guilty, but leave such exploits to be performed by the cautious, piratical crow, or the handsome fillibustering blue jay. These visits of the wren to the domicil of the blue-bird are for the purpose of demolishing its nest, or sucking its eggs, and if surprised in these felonious intentions by the return of the mild, but justly indignant bird which wears the blue coat, it evades its deserved punishment about to be inflicted, by fluttering to the ground on its short curved wings, when it conceals itself in the shrubbery or passing along under cover, a few rods, it rises again to the top of a tree, and utters its hurried, thrilling notes in defiance.

While thus invading the premises of others, the wren is very careful of its own; not a bird can come near them for honest and peaceful purposes, without a hostile threat, or severe scolding, such an one as no other songster, but the one in a drab colored dress, knows how to inflict. Notwithstanding all this, the little churl possesses good qualities, alike noticeable in birds as well as men. Its domestic habits are admirable, taking the best care of its numerous offspring, being careful to warn them of the dangers, which beset their youthful flights, and of the cruel habits of the feline race, as every stealthy marauding cat, (our bird's greatest enemies and tormenters) would be compelled to admit, could these felines, (which should be shot, every one of them, when found in a garden,) be made to testify. The wren is also an industrious bird, its industry being peculiar, and not noticed in other birds. It builds a large nest, if we regard its surroundings, composing a foundation of short crooked sticks, that one would suppose would be very difficult to be managed by so small a bird. His labors, (I here speak more particularly of the male,) are not confined to constructing in connection with his mate, a cradle for his young, but embrace other than this, a constant instinctive desire to labor, when nothing useful is produced, in building nests not wanted, and but half formed. The wren is busy in this unproductive work, simply because he must be employed, cannot afford to be idle.

We see this industrious trait of character in men and think it commendable. I have never seen any thing like it in birds, with the exception of the one under consideration, and it has also been noticed in the house wren of Europe. This labor is usually performed by the wren, when not particularly engaged with its own affairs, by odd jobs, as we say, chiefly when the female is engaged in incubation, when time passes slowly with him, helping to fill up a long day in June; with other engagements, such as scolding at the cat, as soon as he gets his eye upon her, prying into every nook and corner of the garden, by creeping about more like a mouse than a bird, and striving to obtain a general meddlesome knowledge of the affairs of all birds in his neighborhood. This labor, as we have before intimated, consists in forming as many half-finished nests as he can find boxes in which to build.

A friend of mine, desirous of getting as many of these birds to breed in his garden as possible, placed some two or three boxes in his grounds for their accommodation. In conversation he observed to me one day, that his boxes were filled with wrens, and was much pleased with the supposed fact. Knowing the singular propensity of this bird to engage in useless labor, I remarked, upon examination he would probably find but one pair of wrens in his garden. Ah! but, says he, I saw the birds go in and out of the boxes, and build their nests. I replied, we will examine them, and see if we can find eggs or young. Upon examination we found in all the boxes, but the one that was the true domicil of the wrens; nothing but a mass of short, crooked sticks! I never had but one pair of wrens in my grounds at the same time, although I have heard persons say *they had* two pair in the spring, but one of them was caught by a cat. I suppose, in this particular case, grimalkin's character had suffered unjustly, which so seldom happens in the imputed cases of bird-catching, I am particularly desirous here to notice. In my grounds the wren raises two broods in a year, and its sprightly and tremulous note is heard as late as the 20th of September. But little is known of its migratory habits; where it goes in autumn, and from whence it comes in spring, no ornithologist knows. It manages with its short wings to migrate beyond the limits of the union; most probably to Mexico. It comes to us in the night, and its pleasing, lively note is first heard upon a pleasant morning in the early part of May.

Knowing, friend Brown, your love for birds, I send you with this communication an olive-jar expressly prepared for kitty wren. In these jars I have found them more inclined to breed than in anything else, having had one of them in my garden for many years. The way and manner of placing it upon a pole, I have, I think, informed you.

Danvensport, April 30th, 1859.

The Influence of Salt upon the Growth and Health of Cattle.

The practice of salting stock at regular intervals, of generally about once a week, is maintained by all good farmers. When cattle and other farm stock are allowed to partake of salt at pleasure, it is found that in the season of the year when the grass is making its most luxuriant growth and is the most succulent, the consumption of salt is the greatest. Besides the beneficial effects of salt upon the animal system, its use serves as an important means to call together at stated periods the large herds that are pastured on the prairies and plains. Stock that have been thus treated expect it and are ready to answer at the first call of the herdsman.

Boussingault made some observations concerning the influence of salt upon the fattening of cattle. His experiments show that salt does not exert that beneficial influence on the growth of cattle and the production of flesh which is usually attributed to it. His experiments extended over a period of thirteen months, and were made upon a number of steers, some of which had their rations salted, while others had not; in other respects they were treated in a precisely similar manner. The results show that the increase in the proportion of flesh does not pay for the salt employed. It is, however, remarked that a saline diet does exert a beneficial effect on the appearance and condition of the animals, for the steers which were deprived of salt for eleven months appeared sluggish and of a languid temperament, their coats being rough, devoid of gloss and partially bare, while those which had been fed with salt were lively, had a fine glossy coat, and were sure to attain a considerably higher price in the market.

From the observations of this distinguished agriculturist and chemist, although it does not appear that there was an actual cash profit in feeding salt to his steers, yet from the sleek, healthy appearance of those treated to it, it evidently contributed to their health, and we believe nature not only demands, but requires it.—*Valley Farmer.*

For the Southern Planter.

Tobacco the Bane of Virginia Husbandry.

No. 4.

Let it be granted that a plantation with the proper equipment of hands under the tobacco system, can work out of the soil a larger income in dollars and cents for a limited number of years by the tobacco crop, than can be realized in cash by a farming course—yet it may be shown, that the tobacco culture is an illustration of the Fable of the Goose that laid the golden eggs—it may be worth the while in this progressive age to present the arguments on the other side, notwithstanding the above formidable admission, sustained as it *seems* to be by "the Almighty Dollar."

Not one jot or tittle of the charge against tobacco, as the most exhausting of all crops can be abated. The impoverished fields of the whole State, where it was once cultivated as the staple crop, but for the last quarter century has been abandoned because it no longer yielded a remuneration for the labor employed in its production, is conclusive evidence of the alleged fact.

Every county of Virginia, from the seaboard to the head of tide-water, with several tier of counties above, in their natural State one of the loveliest regions on earth, now presents a standing monument against the ruthless destroyer, in a wilderness of piney old fields and gullied hill-sides, hitherto the acknowledged fruits of the tobacco culture.

It is now argued, that Virginia owes her late reduced state to the corn culture, and not to tobacco, and as a farther apology for tobacco, that the country was originally poor.

The fact that corn has been continually a profitable crop, throughout all the counties where tobacco has ceased to be cultivated, is well known; and it is equally well known that the corn crops have been steadily increasing in productiveness since tobacco has been given up, which is a sufficient answer to the unjustifiable assumption. And as to the original poverty of the country, we need only refer to one witness to the contrary, whose testimony will hardly be questioned; the most authentic and earliest Historian of Virginia—the gallant and distinguished, and above all, the Christian gentleman, Capt. John Smith. See Smith's History of Virginia upon the point. If the testimony of this witness, added to the every-where-existing-frightful piney old-field and gullied hill-side monument, do not convince, it may be useless to resort to any further argument on this point. But let the subject be presented under the only aspect likely to attract the attention of the mass of cultivators—the pound, shilling and pence aspect—and results may be shown upon bases of fair calculation, that will bring the rival systems of the plantation and farm more nearly upon a par as to profits, than the larger cash income from tobacco, claimed by its advocates, would seem to allow.

It may be safely assumed, that three times as many hands are necessary, and usually employed for a full-handed and well-found tobacco plantation, as for a farm of the same arable surface, upon a strictly farming system. We will make our calculations upon a medium sized plantation of twelve hands; a farm of the same arable surface and equal value would require four hands, and here of course in the all-important item of labor, the value of the hire of eight hands is fairly chargeable against the plantation, and forms a large offset against the tobacco cash income—but it is fair here to allow that the greater cost of utensils and machinery upon the farm than the plantation, must go in abatement of the offset referred to above. Nevertheless, when the increased annual value of the real estate of the farmer is taken into the account, (as it reasonably should,) it leaves but a small, if any, balance of cash in favor of the plantation system, and if nearly equal at the outset, there must, soon, be a wide difference between them.

If the planter, with all the modern progress of agricultural science, aided by the new fertilizers, can improve or keep up the value of his land, (a question yet requiring further experience to settle,) it may be assumed, that he cannot improve his land in any degree of comparison with the farmer, for reasons already shown in my former numbers—the value of the real estate of the planter, if not positively at a stand-still, advances at a snail's pace in comparison with that of the skilful farmer. True, the farmer's improvements cannot be represented by any fixed quantity, for they depend upon the skill and energy of the manager, which is ever variable. The marked difference between the two is discoverable in many points. The planter may have a larger amount of dollars to meet his indebtedness when he sells his tobacco, than comes at any one time in the year into the hands of the farmer—but the planter has to draw upon his dollars to buy a part of his bread corn, almost all his meat, and the whole of his teams; the farmer makes and raises them all at home.

The planting system is essentially connected with the credit system--although the weed always commands the cash—yet the planter is kept behind the time, because it takes him a year and a half to compass his crop, while the farmer gets through all in a year.

If the planter has any surplus funds after paying for his necessary supplies, they go to buy fresh lands and more hands to make tobacco: the skilful farmer's investments go to the addition of his real estate, an investment which never fails, as legally constituted bodies corporate sometimes do.—Moreover, the farmer's improvements are identified with all the more rational endearments of home. Where, beside the broad acres under a course of improving husbandry, are seen the ever fresh and still growing comforts of the garden, the verdant lawn, the shade trees, and the blithe painted cottage, with the farm yard hard by, with all its interesting accompaniments, forming a little earthly paradise. Now let us compare with this the plantation and its domicile—often a dilapidation in the midst (technically speaking) of a standing tobacco lot; if inclosed, fenced in with a worm fence made of mauled rails—including half an acre for a cabbage patch, called the garden, leaving a narrow margin of turf around the unpainted dwelling, because more could not be spared from the tobacco crop. These form the well known features of the establishments of many of the devotees of the tobacco culture. But after all it is still triumphantly harped that the planter can make a larger amount of dollars than the farmer; but admitting it to be so, has not the time come when the reduced state of the fee simple value of the country calls for a change?

It is the highest aspiration of the regular tobacco maker to add to the number of his hands, buy fresh lands, and make larger crops of tobacco.

Strange that the obduracy of agricultural habit, in our enlightened community, and this progressive age, should hold so many still, spell-bound to a system which the face of the country, from the sea-board to the mountains bears melancholy testimony to the ruinous effects of, in that it has converted one of the loveliest regions of the earth into a broad wilderness of piney old fields and gullied hill sides—nor is it within the compass of human ingenuity to conceal the fact, that this wide spread ruin has been the work of the tobacco culture.

But we may console ourselves that "all things are mutable and nothing fixed," and that the culture of tobacco in Virginia, must, in the nature of things, continue to run down, and must finally give place to the more rational, moral, and comfortable farming system. The blessings of this change are apparent already in all the tide-water counties from which tobacco has been longest excluded. Recently these counties are showing a degree of improvement, which will soon bring up the value of their lands to those of the best of the now remaining "tobacco-land" districts; the price of the former are steadily advancing, while the price of the latter must inevitably fall under the short process of three successive crops, which always does the work of completely exhausting the richest soil for tobacco, until it is manured. But if the present high prices under the stimulating artifice of the lottery, gambling principle, which of late years has been brought into the market, leads to keeping up the crop, the effects must be disastrous, morally, as well as agriculturally.

The mass of tobacco makers will judge of the arguments urging the abandonment of the crop, upon the exclusive principles of rural economy, but there are many individuals of the highest class amongst them—that class that constitute "the salt of the earth,"—to whom the matter may be presented under a far more interesting aspect, than the pound, shilling and pence aspect. I shall therefore address my future numbers to those only that hold themselves responsible for the morality of their calling.

(Signed) JOHN H. COCKE.

To thine own self be true.

From the Gardner's Monthly.

The Philosophy of Transplanting.

What is the secret of successful planting? Why do some trees live, and some die under the operation? Why do they not all live? Why do any of them die?

Though comprising some of the simplest of questions, and affording as simple answers, who has ever heard a satisfactory one given? Jupiter, when he undertook to receive the complainings of the sons of men, could not be more struck with the opposite nature of their wants and wishes, than a new beginner in the planting line must be at the varying and contradictory advice he is constantly receiving. "Don't plant in fall," "Don't plant in spring," "Prune severely," "Don't prune," "Water at planting," "Don't water:" but we may as well stop. As to reasoning on the matter, who attempts it? Some few do; but how do they do it? "Dogmatically, dictatorially and absurdly."

"I have done with getting trees from Brown. Lost three-fourths of what I got from him last year."

"Trees do best from a change of soil. Those I got from neighbor Smith's nursery all died. Those from Nebraska all lived."

"It don't do to spit on your hands while planting trees. I set out two last year; had to stop for that purpose while filling in one, and that one died; the other is doing well."

Of course, you will say the last reasoning is absurd, but it is no more so than any of the others.

Now, if we can only demonstrate why a transplanted tree dies at all, all the questions about the time and season and manner of planting may be compressed into a small paragraph. It needs no reasoning to tell us an umbrella is useful in rainy weather, or that a well-corked bottle will keep the liquid safely inside for an indefinite period, and yet these simple facts might be so confused by words, and obscured by scientific verbiage, that a score of opinions might be conscientiously entertained of them. This is the way errors arise in the idea of tree planting. We read learned disquisitions on the functions of the leaves, and their relation to the roots—of the cells and tissues, and of crude sap and sap elaborated; and after all the terms in physiology have been exhausted to show the cause of the death of a transplanted tree, it all amounts to this matter-of-fact conclusion: that it died through being *dried up*;

Through being dried up! You may as well tell us an animal dies for want of breath.

And if it does, we may not be able to give the breath, but we may give the necessary moisture to the tree. To make the matter plain, if we take up one of two trees, and leave it exposed for a few days, it dies,—it withers and shrinks away; but the other lives on as ever. Evaporation is continually going on from the branches of trees. In the exposed tree the roots are prevented from supplying the waste; in the other they maintain the balance; so that the one dies and the other lives.

Shall we now say that every case of death from transplanting is only a modification of this simple process? Indeed, it is from no other cause. The tree has *dried up*.

It is a remarkable circumstance that our physiological writers have nearly, we may say quite, overlooked this matter of evaporation. Only a few days ago, we read a very learned disquisition, showing that trees should never be pruned at transplanting, because the speedy production of roots was a great object; and as the elaborated sap in the branches was the matter from which roots were formed, why the more branches the better for the roots. All true enough, my good friend, if you could prevent the moisture from drying out in the mean time; but there's the rub,—the more surface the more waste.

A few days ago, one-half of a large worm was thrown into the writer's aquarium, as food for the fish; the other half was forgotten, and left in the open air. A few hours after, and this half was entirely dead—dried up. The half in the water-tank had managed to get beneath a rock, safe from the watering mouths of the pikes and tadpoles, and twenty-four hours after, it was still there, as lively as ever. "That is the idea again!" we exclaimed,—the check to evaporation saved its life. It could not easily dry up there; and so we carried the idea again to the tree.

Instead of laying neglected on the ground, we will say that it is actually planted. The roots are more or less mutilated—that is a necessary result of removal,—and many not mutilated are not, even with the best care, so closely imbedded or surrounded by soil, as to be able to obtain the same amount of moisture from the earth it could before transplanting. And now immediately follows a bitter cold windy day, or a hot and dry time, when the very skies seem like brass, and all nature seems languid and debilitated; the sap is exhausted faster than the roots, so circumstanced, can supply, and just the same as in the totally neglected tree, it dies—*dries up.*

But the result is not often so palpable. No cold winds or hot days perhaps follow for a long time, but the soil is cold, and unfavorable to the production of new roots, and so the tree stays in a state of rest,—laying up no treasures, taking no thought of to-morrow,—and when the adverse time does come, its sandy foundation is discovered. It dies—*it dries up.* So we may go on through a score of illustrations. Still the same explanations, the same reasoning, the same result: it dies—*it dries up.*

From all this it follows, that to succeed in transplanting, all that is necessary is to have control of the evaporating power of the tree—to prevent, in plain language, the sap from drying out of the tree, until the roots have made new fibres, and thus able to supply whatever demands the branches may make on them for moisture.

There are, then, two periods when it is good to plant trees; one is when there is very little evaporation going on from the top of the tree: the other when the roots are active, and the fibres are pushing with freedom and vigor, and the *best time* is when we can get the two to work together. This is not easy. When the thermometer ranges between 30° and 40,° little or no evaporation is going on—the air is saturated with moisture, and a tree might be dug up, and suffered to lie for a week with its roots exposed, without experiencing material injury. Such times we often find in November and December, February and March, and at various times at other seasons. But the opposite objection arises; the ground is cold, and the roots, though not perhaps entirely dormant, are but little active. Again in the spring the roots are very active, and are ready to draw water almost as soon as the tree is transplanted; but—again that implacable *but*—the wood has become soft and spongy, and the atmosphere warm and drying, and evaporation goes on so very, *very* fast, that the advantages of the newly pushing roots are more than balanced.

In whatever way we look at the subject, this conclusion is apparent; that to be successful with tree-planting, *evaporation from the branches must be checked until the new fibres push.* Recognize this principle, and trees may be transplanted at any time of the year.

What will our readers say to the doctrine that deciduous trees can be removed more successfully in May and June than at any other season? But it is a fact. It must not be done in the usual way. The leaves have to be stripped off, and the young growth shortened-in; evaporation is arrested, and the young roots, rejoicing in their newly-found liberty, push forth in all directions, and sustain the tree at once. New buds and leaves start immediately, and the tree goes on apparently with very little check.

Over and over again have we seen, during the past few seasons, trees taken up in May and June, and in August and September, and with the most complete success.

And now, dear reader, do not think that we are offering you crude theories, that have yet to be elaborated by the pure air of practice; or that we have taken an idea from some contemporary's sensation leaders, and with the aid of a few principles stolen from some learned physiologist's deductions, turned out of the editorial machine a piece of work that is to astonish you. That is sometimes true, and the authors or manufacturers get a greater reputation for learning than the more honest fools, as Shakspeare calls them. But this idea of late spring planting is becoming very practical here. It is now understood by many of our practical planters. As we now write, (first week in June) one of our most popular jobbing gardeners is driving by our office, with a large load of trees, which he would warrant for a small per centage, to give you more satisfaction than trees planted in March.

It is more trouble, to be sure, to prune and strip the leaves from the trees, and the whole care required to control this evaporation costs more than trees set out in the usual time and way; but to many a man, labor is better worth five dollars in April, when every thing has to be done at once, than it is in June, when nearly all is finished up.

Without making this chapter too long, it is impossible to go into the details of this idea as we would like to do. The reader must apply the principle for himself. He must check evaporation till new roots are produced, either by syringing, or shading, or pruning, or disleafing; he must do all he can to insure a rapid formation of new fibres. He must, in fact, experiment and observe a little for himself; and when he, as he soon will be, becomes master of the idea, he may remove things at any time of year when he has the most leisure and inclination.

From the Indiana Farmer.

Straw and its Waste—Its Worth per Acre.

BY J. J. MECHI, OF TIPTREE HALL, ENGLAND.

SIR, This is a vital question for agriculture. For many years I have been gradually more and more convinced that straw has a considerable value for feeding purposes, for which alone it should be used, in order to extract from it the largest profit.

It is true that, when I have propounded this notion in the presence of practical farmers, their shouts of laughter have testified to their disbelief; and I have smiled at their prejudices and miscalculation, in conscious conviction that they would gradually have to surrender at discretion.

The quantity of wheat straw removed from an acre of well-farmed clay, where the average is 40 bushels per acre, would be 2 tons per acre. Science has shown us that, plowed in and considered as manure, its worth is but $2.24 per ton; while, used as food, it will, if properly prepared, realize a value of $10.00 per ton. Now what farmer would knowingly throw away $10 to $15 per acre, in so economic a business as farming? and yet, this is literally being done over millions of acres.

It is denied that straw has a greater value as food than as manure, it would, by parity of reasoning, be desirable to compare the manurial and feeding values of oilcake, barley, beans, peas, hay and roots.

While my farming friends ridicule my dislike to plowing in straw, they would stand aghast at my proposing to them to plow in their barley-meal, linseed-cake, or other feeding material.

But I can see no difference: the folly or error in each case is equal, and the loss comparatively as great.

Whence does this singular disbelief arise? Simply because the straw, in an unprepared condition, is not in an available condition as food.

I purpose to give a practical illustration of this question, by a statement of my own proceedings; but every one who would understand the question in its most comprehensive view, should study Mr. Horsfall's admirable papers on dairy management, in the Society's Journal. The whole feeding question may be considered as greatly developed by these papers.

The question of converting both our straw and our roots more advantageously than we now do, is a true breeches-pocket question for the British farmer; nor are the public less interested in the more abundant supply of meat, which would naturally follow the more economic use for our straw and roots.

The general appearance of thriving animals is unmistakable. If, after feeding, they lie down contentedly, free from restlessness, all goes on well. Such is the case with my ten young shorthorn bullocks, of Irish breed, about 30 months old, which were bought at $45 each, in 1858.

They consume daily—

216	gallons	cut wheat straw	
6	do	rapecake	$0 60
3	do	malt-combs	0 09
5	do	bran	0 10
		Moistened by	
20	gallons	of hot water (bean straw requires twice the quantity)	
300	lbs.	of mangel-wurtzel	0 64

In round numbers, they cost at the rate of $0.84 per week, independent of the wheat straw. If I value the wheat straw at $10.00 per ton, it would add $0.60 to their weekly cost. The roots I value at $2.50 per ton. The animals are in a fattening and growing condition, and evidently are advancing remuneratively. This we can judge of by their appearance, as I have not, like Mr. Horsfall, a weighing machine for cattle. Nothing tests the value or force of food so soon as milking cows. I strictly adhere to Mr. Horsfall's proportions of food for mine; and the result is an ample supply of milk, and an increase in condition.

The food for each cow is as follows, daily: 20 lbs. straw chaff; 8 lbs. of hay; 5 lbs. rapecake; 2 lbs. bean meal $\frac{3}{4}$ lbs. bran; $\frac{3}{4}$ lbs. malt-combs; 35 lbs. mangel or Swedes. Cost (without straw), $1.82 per week.

The whole question may be said to hinge upon the condition in which the food is administered. It must be moist and warm; and the animals must have proper warmth and shelter. As a general rule, this is not the case throughout the kingdom; hence much food is wasted or misapplied. Were I to give my bullocks the same quantity of cut straw in a dry state, they would not eat one-half of it; and, besides, they would be restless and dissatisfied. This I know from experience.

I will now describe my mode of preparation, and calculate the cost.

I do not use the ordinary close steaming apparatus, but a number of cast iron pans, or coppers, each capable of containing 250 gallons. These are set in brickwork, with a 4-inch space around them, each space connected with the adjoining one by a 6-inch earthern pipe.

Into these spaces, and around these coppers circulates a portion of the waste steam from the engine, after having passed through the cylinder.

I should state that a close vessel of water, connected with the supply tank, is kept in a nearly boiling state by the waste steam before it passes around the coppers, and a vertical four-inch pipe takes away the steam after it has passed around the coppers, after heating the close vessel of water, and then passes into the atmosphere.

The coppers are all sunk into the earth, so as to stand level with the floor.

By this means, when an extra supply of food is required, it may be piled up in a mound, and kept hot for two or three days.

The straw, cut fine and sifted, is thrown into the copper, twenty-seven gallons at a time, and then the proportion of malt-combs, bran, and rapecake strewed over it; then a pail of hot water (drawn from the hot water vessel close at hand) is thrown over it, and it is all incorporated by mixing with a steel fork, and well trodden down; then another twenty-seven gallons of chaff, with the other materials and hot water; another mixing and another treading down, until the copper is full and solid; and if extra quantities are required, it may be continued in the same way above and around the coppers, but it must be moist and solid (if too wet the animals will not eat it.) The larger the mass the longer it remains hot.

Practically, we can in winter manage, if our engine only goes twice a week; but as a general rule we work it for grinding, irrigating, thrashing, &c., more often than that. The mass of subterranean brick-work absorbs the heat from the waste steam, and holds it for several days.

The heat so obtained costs you nothing, for it would be wasted in the atmosphere.

I think the time will come when farmers will turn it to several useful purposes.

Animals will eat rapecake abundantly when so mixed and dissolved, but not when dry.

This is an admirable food for all sorts of farm animals, and it should be administered, more or less, through the whole year.

I should say that our roots are cut either by a Gardner or Bentall, and mixed in the manger with the warm steamed chaff. There will be no blowing, no griping, or scouring with food so prepared, and the animals eat it as hot as they can bear it.

In my earlier career, I reared first forty and then fifty calves, and sold them as fat bullocks, so treated, never having been off the boarded floor for two and a half years, and never having had straw under them.

The ten bullocks I am now feeding are on sparred floors.

The cost of cutting a ton of straw into chaff, one-fourth of an inch long, may be taken at 72 to 90 cents. The trials of chaff-cutters, as reported by the judges, in the Royal Agricultural Society's Journal, show that 112 lbs. or more of hay could be cut in three minutes by steam power. It would be well, however, to double that time or cost, because we know on such occasons everything is in "competing order," which could not be expected on a farm. Therefore, 48 cents a ton for hay,. and 96 cents per ton for straw, would be a liberal cutting-up, allowance for steam power.

If we are to consume all our bean, barley, wheat, and oat straw, we must keep our animals on sparred floors, or on burned clay, and we must invest more capital in animals, and shall make much more meat per acre. If a ton of straw will make 30 lbs. of meat, and if two tons of straw are grown per acre on our cereal and pulse crops, it would be four score of meat per acre over the whole of the cereals and pulse.

Oh! but where is your manure to come from, if you eat your straw?

Why your animal, by this mode of feeding, consumes 560 lbs. of rapecake with every ton of straw. This is better than littering the yards by cartloads in wet weather, to sop up the water, and save some of the liquid manure which would otherwise be washed away by rain from untroughed roofs.

But what feeding property is there in straw?

A good deal of hilarity was excited at our London Farmers' Club the other day, by my stating that every 100 lbs. of wheat straw, contained the equivalent of 15 lbs. of oil. Since then I find I have understated the case, and that really each 100 lbs. of straw contains—see Morton's admirable Cyclopedia, vol. ii, page 1153 (Voelcker's analysis)—seventy-two per cent! of muscle fat and heat-producing substances, of which twenty-seven per cent. are soluble in potash, and thirty-five per cent. insoluble.

The soluble fattening substances are equal to 18½ lbs. of oil in each 100 lbs. of straw.

In conclusion, I would recommend every feeder of stock to study Mr. Horsfoll's papers in vol. xvii., page 260, and vol. xviii., page 150 of the Royal Agricultural Society's Journal. They will enlighten his mind, dispel his prejudices, and increase his profit.

By Mr. Horsfall's mode of feeding you may get the manure without cost, and a handsome price for your straw and roots.

The following facts, deduced from Mr. Horsfall's paper, will show that 1,000 lbs. of Swedish turnips, or 100 lbs. dry are worth, 43½ as manure, whilst

100 lbs. of hay are worth............	$0 28½
100 lbs. of straw....................	0 10
100 lbs. of bean meal................	0 60
100 lbs. of oilcake..................	0 75
100 lbs. of Indian meal..............	0 25½
100 lbs. of locust beans...........	0 10

Here is an instructive and interesting comparison with a vengeance! A ton of Swedish turnips are worth, as manure, 96 cents per ton, or nearly half the manurial value of a ton of straw or locust beans.

Oilcake, or rapecake are worth, as manure, $15.12 per ton.

If by his system of feeding 14 lbs. per week of meat and 3 lbs. of internal fat can be gained by each full-sized animal (and I am sure this can be done as an average,) I know of no other system which will exceed it in result, or equal it in economy.

The consumption of straw, in the way here suggested, would produce a very great increase of meat, manure, and corn.

If supplies of this warm food were conveyed to sheep in our field in cold and miserable weather, many losses would be avoided, and our turnips would make more mutton.

In order to provoke a discussion and examination of this subject, I send this communication to several papers, and shall probably enlarge upon it in some future paper.

From the Gardner's Monthly.

Improvement of the Soil.

Mr. Editor:

"Every one to his taste," is a trite old saying, and I have no doubt a very true one; and it suggests itself particularly to me just now, when taking up my pen to write you a few hints that occur to me about the subject named at the head of this chapter. I notice that many of your correspondents congratulate you that *this* subject has been brought up, and *that* subject has been explained; but to me there have been few articles in any paper I ever read, that gave me more pleasure than one on "Trenching Ground," and another on "Surface Manuring," in some recent numbers of your journal; because I think that by getting at the soil question properly, we come to the *bottom*, —the *root* of all improved culture.

Now, sir, it seems to me that in the discussion of this question, most practical men forget that there are two distinct objects to be aimed at. The first is that in working soil we are to render it fit to retain the greatest amount of heat and moisture that will benefit the plants, and no more; and the second is that we should convey into the soil such elements, in the shape of manures, as will most effectually perfect the growth of the plants.

A soil may contain all the fertilizing ingredients desirable,—all the carbon and nitrogen,—all the *sodium*, *potassium*, and what other *iums* go to make up the vocabulary of a chemist's treatise on the perfection of soils; but if it have not the capacity to retain heat and moisture in due proportion, —if it dry up the first hot June day, or remain cold and swampy when other soils permit their tenants to bask in the warmth of a few spring days' suns,—it is altogether imperfect.

Then, again, it may be perfect in this respect. It may be deep, and its particles finely disintegrated, and its capacity to retain heat and moisture so admirably balanced, that the most enthusiastic trencher could wish no more; and for all this, in the chief elements that constitute a fertile soil, it may be as poor as a miserable bit of humanity who has no friends; and what under the sun can be poorer?

We find great difference of opinion to exist amongst men equally famed for their practical knowledge. One manures on the surface, and finds great benefit from the application, and then, perhaps, he goes further, and deprecates all those modes of practice which buries the manure far below the surface; another digs it deeply into the soil, and in the result obtains his every anticipation.

Looking at manures as fertilizing ingredients, the one who employs them at the surface, evidently has the best of the argument. The roots, properly so called, and which penetrate deeply into the soil, do not much towards supplying the plant with nutriment,—it is the fibres which are attached to the roots, or rather their points, or *spongioles*, as the physiologist terms them, which collect the feeding matter. The roots are the drones, and the fibres are the working bees of the vegetable hive. Now, the fibres are invariably found in the greatest abundance near the surface, and there, as a necessary corollary, is the place to furnish the necessary food.

But the roots, if they do not do much towards taking in substantail food, at least absorb an incredible degree of moisture, and the man who mixes his manure deeply in the soil, does a great deal towards incresing the power of the soil to retain moisture. All the vegetable matter he mixes in beneath the surface assumes a sponge-like character, with the same absorbing property, which, as also like a sponge, it gives off to whatever surrounds it that may become dryer than itself. Let not, therefore, him who sees his neighbor mixing long strawy manure a foot or more below the surface, say in his heart, "Oh! fool!" or him who espies the other raking at the surface, exclaim, "Thou jackass!" but let each of them watch the process in either instance, and mark the result.

With regard to trenching, Mr. Editor, I could never see what benefit was to arise from throwing good surface-soil two or three feet below the surface, when the most expected of the poor subsoil brought up was that it should be ultimately made as good as the soil originally thrown below. It always seemed to me something of the robbing the hen to fat the goose kind of a system, by which something was made on twelve, but as much lost on the dozen. But if by trenching is meant deepening a soil, and making it, by mixing vegetable matter with the subsoil, to retain heat and moisture in all weather, why then I am with you, heart and soul,

> "And here's a hand, my trusty flere,
> And gie's a hand 'othine."

If you do not receive the assent of all practitioners, you will at least have that pleasure from one who likes to look at things

PRO AND CON.

Summer Grazing—Grazing of Cattle.

BY A PRACTICAL FARMER.

A too frequent recurrence to the same subject needs every apology from stated writers; but the importance of the above subject to graziers, and the rapid increase of the numbers who read the *Mark Lane Express*, is a sufficient reason for again introducing the subject. I am not, however, about to write anything expressly new, or perhaps of much value to the experienced grazier: but amongst the many readers of the above paper, there are young readers who would like to "gain a wrinkle" from an old grazier, or to be reminded of some common things which may have escaped their present observation, it is for these I write a few remarks upon summer grazing in these papers. 1st, cattle; 2nd, sheep; 3rd, horses, &c., &c.

The grazing of cattle, the fattening of cattle, the lands adapted for the profitable raising of cattle must be of first class order. No inferior grass lands will do it, unless aided by a liberal allowance of linseed-cake or other fattening food; nevertheless, we have good grass lands of varied quality and power. The most powerful will fatten an ox of 100 stones weight without such aids; and others of such sweet and nutritive herbage on inferior soils as will fatten a Scot or Devon admirably. What I mean is, that the grazier must adapt his cattle to his land, or make up for either deficiency in artificial aids as food. No grazier should, however, attempt to fatten cattle on land not suited for such purpose; and this is soon generally known by the experience of every occupier, and on every occupation; and new tenants often injure themselves by not taking timely advice on this point. The best bullock-lands; These are usually grazed by superior cattle, and I take it for granted that the general testimony and practice on such lands is correct, and in the average of years profitable. One thing I know, the occupiers of these beautiful lands are almost invariably to a man proud of them, and proud to see grazing upon them such splendid animals. This is one of the pleasures and gratifications of business. What grazier does not enjoy, intensely enjoy his evening stroll amongst a herd of first-class animals, all progressing favorably; and may he not justly exult a little now and then in the prospect of showing them at his favorite fair, and to his old round of friends and customers? I confess to such occasional pride, and I approve it. It gives stimulous to exertion, to care, to selection, to management in all its phases. This is all right; but there is another view to be taken as to the most profitable grazing of such lands. It is not that every grazier possesses a long purse, and is able to buy such ornaments to his field. What must the poor grazier do? I have seen some of the most powerful bullock lands grazed by very inferior cattle—aged cows, bull-legs, worked oxen, coarse steers; in fact, such a class of animals as only such land "could move," and which was well known to the occupiers; these animals often come in at little cost, and pay handsomely. I once saw a large and beautiful field of first-class land grazed by aged cows and a few coarse animals which would not average above some six or seven hundred pounds each; the profit was, I understood, very great. The care requisite in such a case is to obtain such animals as will bear a profit under such strong succulent herbage. If the animal is weak in body or constitution, it is certain to go wrong. It is therefore, manifest that first-class land need not of necessity be grazed by first class animals; but it is necessary that every animal grazed on such land must possess a constitution and aptitude to fatten and improve.

To graze profitably, the grazier must first take care to provide a good pasture. This he will do by "laying in" his fields early; so that he may commence stocking early. His next care will be to put in his stock in suitable weather, and in number proportioned to his keeping. He must not in any case overstock; if he does, in all probability he will lose his season. His stock must have a sufficiency of grass, but not more, or it will grow coarse and unpalatable, and the stock are thus confined to those sweet spots on which they delight to browse, often very bare and insufficient for their profitable advancement. Should such be the case, it is but to mow down gradually and daily every rough spot, and leave enough for every day's consumption. Cattle are very fond of partially-withered grass. There is great difficulty on this point in grazing lands subject to burning in hot weather; such lands "require a covering;" but I cannot think they require such a covering as is sometimes, nay often, seen. I have seen some of those beautiful Herefordshire lands, having pastures which, while carrying their usual quantity of stock, would, I think, yield at the same time a ton or more of hay per acre, positively "up to the knees in grass." In Leicestershire I have seen the like; yes, and in many other counties too. Now, if this could with safety be prevented, I doubt not but the grazing would be more profitable. To fatten cattle most speedily and advantageously, the grass requires to be ever new, and always in plenty. A bullock pasture—*i. e.*, not too young; that would cause looseness or scouring; but a good bite of strong-grown grass, but not old—just in accordance with the old adage, "twelve days old for a bullock." To insure this, it is often attempted to graze two fields alternately; that is, to lay one in for three or four weeks, while the other is being grazed, and then to bring back the stock as soon as ready. But this plan is objectionable, as requiring a double number of stock for the time being, which tread down a large quantity of most excellent herbage. The better course is to "get off" the forward animals to market, lay in one field, and well dress it over; *i. e.*, knock the droppings and cut up the tussocks or rough places, that all the grass may be young and fresh, and then turn the backward animals into this beautiful autumn pasture; they will on this seldom fail to get fat. The old-fashioned course is to reserve the best aftermath or eddish for this purpose, and failing this, to bring them into the hovel or byre for the winter. This is wofully expensive, and seldom pays. If a bullock will not fat by the above process of grazing, I would advise the graziers to quit him. It is customary with most graziers to reserve a few prime animals for Christmas. I know of no better course than to make the same provision for their benefit as for the backward ones except an allowance of corn meal or cake amply sufficient to promote their rapid progress—no reasonable expense must be spared to get up a Christmas ox. Butchers will have perfection in their Christmas beef if possible, and don't mind paying for it; short of this it becomes good ordinary beef, and is bought accordingly; very good certainly; but it don't reach the top standard. To achieve this desirable point, each animal as soon as the pastures are done should have a separate byre or hovel where he can roam at pleasure. He must be supplied with the best of food, *i. e.*, turnips, carrots, cabbage, hay—all of the best quality, the root cleaned and sliced or pulped, and given with the greatest regularity, and then the animal must be left undisturbed. If he can be kept stalled or in a dark stable or hovel all the better, and an occasional or daily grooming is very serviceable. Fatting animals seldom require the services of the veterinary practitioner: the chief point to be observed in keeping them in a thriving condition is to change their keeping if requisite; and this will be principally needed in untoward seasons, or upon an extraordinary flush of grass or similar deviations from common ordinary grazing, as in seasons of drought. The water becomes in many localities pernicious, when it will require much care to avert injurious consequences. Nearly all these matters depend upon the judgment of the grazier. "It is the eye of the master that grazeth the ox." The chief changes in keeping are from a nutritious to old pasturage, from bad herbage and bad water to an eddish or green clover or seeds; or if dry food is indispensable an allowance of straw or hay is highly advantageous.—*Mark lane Express.*

Practical Men.

Professor Henry says:

"*Mere Practical Men.* We have no sympathy with the cant of the day, with reference to 'practical men,' if by this term is meant those who act without reference to well established general laws, and are merely guided by empirical rules or undigested experience. However rapidly and skilfully such a person may perform his task, and however useful he may be within the limited sphere of his experience, and in the practice of rules given by others, he is incapable of making true progress. His attempts at improvement are generally not only failures, involving a loss of time, of labor, and of materials, but such as could readily have been predicted by any one having the requisite amount of scientific information. It is the combination of theoretical knowledge with practical skill, which forms the most efficient and reliable character, and it should be the object of the agricultural colleges to produce educational results of this kind."

* * * * *

We are glad to see the above by Prof. Henry, as it particularly applies to agriculturists. The future of agriculture will owe its progress to those who, in addition to pysical ability, will apply the lights of science to their vocation. No man can be a *practical* farmer who simply delves as a laborer, without understanding, at least in degree, causes as well as effects. To succeed in a *special locality* by simply carrying out the practice of others, will not insure progress elsewhere. Where natural law is fairly understood, then the operator can apply his knowledge to any locality or variety of circumstances. Farmers should at least know so much of the sciences, as will enable them to clearly comprehend the writings of those who investigate more clearly than themselves.—*Farmer and Planter.*

Sounding Shells.

There are few persons who cannot remember childish wonder with which they were filled, when a sea-shell was first placed to the ear; and the still greater wonder they experienced when told that the strange resonance which they heard was the roar of the sea; this being the common explanation given to children. There are, doubtless, many adult persons who do not know the phenomenon of the sounding shell. It is caused by its hollow form and polished surface; these enable it to receive and return the beatings of all the sounds which tremble in the air that surrounds it.—*Scientific American.*

Wood ashes and common salt, wet with water, will stop the cracks of a stove, and prevent the smoke from escaping.

A gallon of good strong lye put in a barrel of hard water, will make it soft as rain water.

Half a cranberry bound on a corn will soon kill it.

For the Southern Planter.

On Curing Tobacco Yellow.

Tobacco should be very ripe when cut. In order to cure a fancy crop, it is necessary to select your tobacco as you cut it, in order to get a house full as uniform as possible of plants that ripen a yellow colour. I put my tobacco in the house as soon as possible after cutting it, putting six to eight plants on a stick four and a half feet long, placing the sticks at a distance on the tier polls, so that the tobacco does not touch after it is hung in the house. Commence firing immediately with coal, at 100 degrees Fahrenheit twenty-four hours—the next twelve hours 105°, the next six hours 110°, the next six hours 115°—then increase 2½° every hour until you attain 165°, and remain at that degree until your tobacco is thoroughly cured. The stalk should be dry when you quit firing. As soon as your tobacco is soft enough to move after it is cured, shove the sticks as close together as you can, that it may more effectually retain its colour.

My barns are all 20 feet square, five tier in the body, and as tight as I can make them. I have nine fires to each house, made of coal—either pine or oak, or any other wood is equally as good. It is necessary to keep up the fires night and day.

CASWELL.

Yanceyville, N. C., July 11th, 1859.

For the Southern Planter.

Super-Phosphate of Lime.

Clarke County, Va., June 10th.

We would invite the attention of the *Farmers* of Virginia to Rhodes' Super-Phosphate of Lime, sold in Baltimore. For the last six or eight years, I have been in the constant habit of using Guano upon my wheat, but the *high price* of Guano, and the continued failures of the *clover crop* when the season has been at all dry, induced me, with many of my friends, to try Rhodes' Super-Phosphate of Lime, and the result has been *entirely* satisfactory. At a cost of $45 a ton, in the place of $65, for Guano, we have the finest crop of wheat we ever harvested. One stubble field estimated by good judges, at from 30 *to* 35 *bushels per acre.*

From my own experience of this year, and the use of it last year by some of my neighbors, I do not hesitate to say, that at the *same price,* I would *prefer it, ton for ton, to Guano.* Mr. Rhodes is an accommodating gentleman, and deserves to be patronized.

We are in no way interested in the sale of the Super-Phosphate of Lime, and only give our experience for the benefit of the farmers of Virginia.

A CLARKE COUNTY FARMER.

From Jackson's Agriculture and Dairy Husbandry.

Ploughing.

* * * The object of ploughing is to delve and turn over the soil in ridges, to destroy the surface vegetation by burying it underground, where it rots and forms a kind of manure; to bury the dung spread on the land; to form furrows for different purposes; and, generally speaking, to break up the hard mass of land, and prepare it for the action of the grubber, harrow, and other instruments.

There are certain requisites to constitute *good ploughing*—a skilful ploughman, a steady team of horses, and a properly constructed instrument. Before these can be brought to bear, however, it is essential that the land be tolerably even in its surface. If it be encumbered with large stones upon, or a short way below, the surface, or with whins or furze, or any kind of heights and hollows, it cannot possibly be ploughed to advantage or with neatness. A preliminary to good ploughing, therefore, is to level and clear the land, by lowering its protuberances, filling up its hollows, breaking up and carting away its stones, rooting up stumps of trees, and, if required, draining its springs.

All this has been done within the last seventy years, to probably nine-tenths of the arable land in Scotland. If the land be in a rude condition, and require these and other improvements, another preliminary to a right process of tillage will be its division into fields of from six to twelve acres; the divisions to be hedgerows, walls, or palings, according to local circumstances. Whatever be the nature of the fences, they should occupy as little room as possible, and in moist situations they ought to have a sunk ditch on each side, to receive water from the surface and small drains. In Norfolk, Northumberland, the Lothians, and other highly improved districts, the fields in general are from fifteen to twenty-five acres in extent, each encompassed by fences and ditches, and to all appearance as beautifully trimmed on the surface as a garden.

The following directions to ploughmen, given by Mr. Finlayson in his excellent treatise on the Plough, will be perused with advantage by all who are engaged in tillage:

"Nothing can be more beautiful than a field commodiously laid off, and neatly ploughed. There is even none of men's handiworks that can please the eye more, and at the same time show more of its unruled accuracy, than a lawn which presents ridges of the same width, with furrow-slices running in straight equidistant lines; and that, too, with such minute exactness, as scarcely to be equalled by the gardener.

"It is not the man who makes the greatest ado with the horses who opens his ridges best, but more commonly he who goes steadily and directly forward himself, and keeps such a command, by the reins, as to prevent them from deviating far from the right path, yet without laying *too much stress on their precision*, or checking them suddenly, from one side to the other; and he who can take a straight furrow at first, and continue so to the last, even on a ridge of fifteen feet, will finish with one, two, or three bouts less than one who is all along undoing and overdoing, and that, too, independently of the ease to himself and his team, and the preference of the work in every respect.

"If broadcast ridges are of unequal breadth, bent, or zig-zag, the work cannot be so uniform, and in the turnings much time is lost, and harm done to the land which is ploughed; and with crooked drills there is a loss of ground, an unequal distribution of manure, if such has been applied, and the hoeings cannot be so effectually done where they are far distant, or done at all, without soddening the mould, and injuring the crop, where they are narrower.

"In fine, the grand criterion of ease and proficiency is, that of the ploughman's walking between the stilts, and in the furrow, with a free step and erect body; for thus he is more convenient for himself, has the horses and the plough better at command, and increases not the friction by his weight; for thus *he cannot go*, excepting the horses and the plough are properly adjusted; and proceeding with the least possible obstruction; and thus, too, he is more graceful to look on, than when wriggling with one foot foremost, or moving as if part of his muscles were under the domination of violent spasmodic contraction.

"It would perhaps be impossible to give any thing like *a system of rules* for the most proper and convenient make, size, weight, turn, &c., of a plough for all the varieties of soil, or of diversity to be met with, even in the same ridge; neither shall I make the attempt; but a few rules may be laid down, and observed as axioms in all ordinary circumstances, viz:

"1. The horses should be yoked as near to the plough as possible, without too much confining, or preventing them from taking a free step.

"2. When at work, they should be kept going at a good pace.

"3. The chains or theets should, from where they are suspended over the backs of the horses, point in a direction leading through the muzzle, to the centre of the cutting surfaces of the coulter and share.

"4. The implement, when taking the form of the dimensions required, should stand upright, and glide onwards in the line of progression, without swerving in any particular way.

"5. The ploughman should walk with his body upright, and without using his force to one point, or showing appearance of inclination.

"The untamed and liveliest, or most forward horse, should be put in the furrow, and only bound back to the right or off-theet of the land-horse, at or near the place where the backband joins it, at such length, when stretched at the width required, as to prevent his end of the beam, or double tree, from being before the other. And further, the heads of the two should be connected together by a small rope, or chain, at the distance wanted, giving the furrow-horse power over the other; that is to say, if tender-mouthed, it must be fixed well up on his head, and in the rings of the bit or curb of the other, so that he may have the power of the head over that of the mouth of the land-horse." * * *

Let the draught of the horse go in a direct line to the plough or swingle trees; for if the line be in any way bent, a portion of the power will be lost. Sometimes in England as many as five horses are yoked to a plough, two and two, with one in front; and in most cases of this kind, the power of the foremost horses is partially thrown away, or probably distresses the hind pair of animals. It is not convenient to yoke four or five horses abreast, but it should be fully understood that in that manner they would exert their power to most advantage. Two horses will, in general, do more work yoked abreast to a plough, than four yoked before each other in single file; because some of the power of the foremost horses is always lost in its passage along the sides of the hind horses, and, in turning, the whole draught is imposed upon the hindmost in the row. * * * Unless on very strong soils, or where a great depth is required, two horses with a well-made plough will be found amply sufficient. Where four horses must be employod, yoke them two and two abreast, and let the draught of the foremost pair proceed by a chain from their central swingle tree to the central swingle tree of the hindmost pair, thus passing between the hindmost and going in a direct line to the muzzle of the plough. By this means, the power of both pairs of horses goes unimpaired to the resisting object. Never, on any account, let the power of the foremost pair proceed by two chains along the sides of the hind horses to the outer ends of their swingle trees, for this would only cause a needless expenditure of draught. In Scotland, where the economising of animal power has been carefully studied, all ploughing whatsoever, be the land light or heavy, except when exerted on the subsoil, is performed with but two horses, and these invariably yoked abreast.

It is a well-known maxim in tillage, that clay or tenacious soils should never be ploughed when either two wet or two dry. When too wet, it is tough, and the clods difficult to break; and when too dry, the plough will scarcely penetrate the soil. In ploughing the first time for fallow* or green crops, it is of importaace to begin immediately after harvest, or as soon after wheat sowing as possible, in order that strong tenacious soils may have the full benefit of the frost. On wet stiff soils, frost acts as a most powerful agent in pulverising the earth. It expands the moisture, which, requiring more space, puts the particles of earth out of their place, and renders the soil loose and friable. On such soils there is no rule of husbandry more essential than to open them as early as possible before the winter frosts set in. If left till spring, clay soils may be two wet for ploughing, or if the season be dry, the earth, when turned up, will be in hard clods very unfit for vegetation. Therefore, on farms having a proportion of clay and of light soils, it is necessary that the strong wet land should be ploughed first, providing the weather will allow.

In ploughing, three different points require particular attention; 1st, the depth of the slice to be cut; 2nd, its breath; and 3d, the degree in which it is to be turned over. This last operation depends much upon the construction of the plough, particularly the mould-board, and the care of the ploughman. The breadth and depth of the furrow slice are regulated by judiciously placing the draught on the muzzle or bridle of the plough, setting it so as to be the depth and breadth required. The plough should be so regulated, that if left to itself, and merely prevented from falling over, it would cut a little broader and deeper than is required. The coulter is placed with some inclination towards the left or land side, and the point of the sock or share is slightly bent downwards. The degree to which the furrow slice turns over is regulated by the breadth and depth; the proportion usually being six inches broad to nine deep. When the slice is cut in this proportion, it will be nearly half turned over, or recline at an angle of from 41° to 45°; and a field so ploughed will have its ridges longitudinally ribbed into angular drills or ridgelets. If the slice be considerably greater in width than in depth, it will be almost completely turned over, and each successive slice will overlap that which was turned over immediately before it.

When the depth materially exceeds the width, each slice will fall over on its side, and be somewhat overlapped by the next, leaving all the original surface bare, and only laid obliquely to the horizon. The first of these modes of ploughing on the

* NOTE.—Fallow in English and Scotch husbandry signifies leaving the land for a certain time in a bare, unproductive condition, during which it receives rest from cropping, and is subjected to various processes of ploughing and harrowing, to destroy its noxious weeds. The original signification of the word (of Saxon origin) is *yellow*, and has been applied to bare arable fields in consequence of their general yellow-brown appearance. Fallow-deer signifies yellow deer.

square slice, is the best adapted for stubble land after harvest, when it is to remain during the winter exposed to the influence of frost, preparatory to fallow or green crop. The second, or shallow slice of considerable width, as five inches deep by eight wide, answers best for old ley land, because it covers up the grass turf, and does not bury the manured soil. The third is a most unprofitable and slow operation, which ought seldom or never to be adopted. The general breadth of a slice is from eight to ten inches, and the depth must depend on circumstances, such as the nature of the soil and the object in view. It ought seldom to be less than four, or more than six inches, except on soils of uncommon depth and fertility, or for particular crops, such as carrots. Shallow ploughing, as four inches deep or less, ought always to be used when covering lime, which has a natural tendency to sink in the soil. * * *

Ridges vary in breadth, and are raised more or less in the middle, according to the nature of the soil. On clay and retentive soils, the great object being to procure the free discharge of superfluous water, very narrow ridges are not to be recommended. Those from fifteen to eighteen feet,* the land raised by two gatherings of the plough, are most generally adopted, this width being considered more convenient for manuring, sowing, harrowing, and reaping, than those of a narrower description. On dry ground the ridge may be formed to any breadth thought proper. In many parts of Kent, entire fields may be seen without either ridge or interfurrows, the soil being of such a nature as to admit the water to pass off quickly. On the turnip soils in Berkwickshire, having a free bottom, it is usual to plough the land into ridges of from thirty to thirty-six feet, called band-win ridges, from being reaped by a band of shearers served by one binder. In finishing this kind of soil, more especially before being laid down to grass, it is customary to cast up a narrow ridgelet, or single bout-drill, between the broad ridges which guide the sower; and in the operation of harrowing, all the ridgelets are obliterated, giving a beautiful lawn-like appearance to the field when in pasture. To form the ridges straight and of uniform breadth, the best ploughman on the farm is chosen. With a pole shod with iron, he first marks off the head or end ridges, on which the horses turn when ploughing, and these should generally be equal in breadth to the bounding lines of the field, eighteen feet being little enough space to allow two horses abreast to turn on. The forming of the head ridges first is necessary to let the ploughman know where to step out his plough, when working the other ridges of the field. If this is not attended to, the head ridges will be gashed, and by the turning and cleaning of the plough, earth will be accumulated more in one part than another. This will render them not only unsightly, but in retentive soils will be apt to lodge in the hollows thus formed, which several ploughings will scarcely fill up to their proper level.

In forming the ridges of fields, the proper direction is to make them run north and south, as the grain will ripen more regularly than if running from east to west. On wet and retentive soils, however, the direction of the ridges must depend upon the acclivity of the field, and be formed so as to allow the free discharge of superfluous moisture. Having determined the breadth of the head ridge, the ploughman will measure off the half of the first ridge of the field, if it is to be so gathered, or one ridge and a half if it is to be ploughed flat. At this point he sets up a pole, and in a straight line at some distance, a second and a third, or more, as the irregularity of the surface may render necessary—the last pole being at the end of the intended ridge. He enters the plough at the first pole, and ploughs them all down successively, stopping at each, then setting the poles at the right distance for the next ridge. When he reaches the end, he returns along his former track, correcting any deviations, and throwing a shallow furrow on the side opposite to his former one, which, when reversed, forms the crown of the ridge, and directs the ploughmen who are to follow. By skilful ploughmen, these lines are drawn with great accuracy.

In ploughing land, there are a variety of ways of forming the ridges. On dry soils, the plets of a ridge may be all laid in one direction, and those of the adjoining ridge turned the contrary way; this is termed casting. On soils medium between light

* In Virginia many farmers prefer wider beds, ranging from 30 to 40, and in some cases 60 feet.—[Ed.

and strong, the ridges are split out, so that the crown of the old ridge becomes the furrow of the new; this, in Scotland, is called crown and fur. On strong soils, it is necessary to form the ridges by twice gathering all the furrow slices in the direction of the crown. In this case the ridges are preserved in their original situations, and the inter-furrows in the same places. It is customary, when breaking up these ridges to be worked as summer fallow, to split or cleave them, reversing the former operation by turning the furrow slices outwards, beginning at the furrows and ending at the crowns. In this operation the ridges are cut in two, the old water furrows carefully opened up to serve as surface drains, and an additional series of water furrows formed at the crowns.

In some cases, land is too steep to admit of using the plough in any of the ways mentioned. On such land, farmers, from a desire to have the ridges run directly up and down hill, sometimes draw all the furrow slices down, and drag the plough up-hill again empty. It is much better, however, to form the ridges in a slanting [or horizontal] direction, for this renders the up-hill work easier for the horses, and in the event of heavy rains, the ridges prevent the manure from being washed away.

On strong tenacious soils a pair of good horses ought to plough three quarters of an acre in nine hours; and on the same land, after the first ploughing, or on light soils, an acre, and even a quarter more, is considered a common day's work in Scotland. Throughout the year, an acre may be considered as the average rate of ploughing, allowing for the difference of soils. The whole series of furrows in an English acre, supposing each to be nine inches broad, would extend to 19,360 yards, and adding 12 yards to every 220 for the ground travelled over in turning, the work of one acre may be estimated at 11 miles and nearly 5 furlongs. The late Earl of Mar calculated, that when ridges are 78 yards long, 4 hours and 39 minutes are lost in turning during 8 hours' work, whereas, when ridges are 274 yards long, only 1 hour and 19 minutes are lost during the same period of time.

The proper depth of ploughing since the introduction of thorough draining, has become a subject of dispute. On this subject Sir John Sinclair remarks:—"Deep ploughing, by bringing up new mould, is peculiarly favourable to clover, beans, potatoes, and turnips; and without occasional deep-ploughing, these crops would diminish in quantity, quality, and consequently in value. It is of the utmost consequence, not only by supplying more pasture to the roots of plants, but, above all, by preventing the injurious effects of either too wet or two dry a season. This is a most important consideration, as, if the season is wet, there is a greater depth of soil for absorbing the moisture, so that the plants are not likely to have their roots immersed in water; and in a dry season it is still more useful, for, in the lower part of the cultivated soil, there is a reservoir of moisture which is brought up to the roots of the plants by the evaporation which the heat of the sun occasions." These remarks, coming from such an authority, must go far to recommend the practice of occasional deep ploughing, more especially with regard to its rendering the ground better adapted for the absorption of superfluous, and the retention of necessary, moisture.

Subsoil Ploughing.—The ploughing of the subsoil is a new feature in Scotch husbandry, and deserves particular attention both from the speculative and practical agriculturist. To understand its value, we must revert to matters connected with the constitution of the soil in referenee to vegetation. As already stated, plants consist chiefly of certain elementary gases, in peculiar combination with earthy substances. Nature provides the gases to a certain extent, both from the atmosphere and the ground; but as the supply is inadequate for artificial and regular cropping, the farmer assists in the good work by a due administration of manures. These manures, however, excepting in the case of lime, do not greatly supply the loss of *earthy substances* in vegetation. In taking a heavy crop of grain from the ground, we actually carry away a portion of the soil; and if this be done repeatedly, the land must ultimately be diminished in bulk. To the eye of a common observer, the field after many years' cropping remains the same as ever, but in reality a portion of its contents has disappeared, and what remains is a very different kind of substance from what existed before the cropping commenced.

If any one has a doubt of the correctness of these observations, let him take the stalk of any plant, and, after drying, burn it to ashes; then bray the ashes on a plate of stoneware, and he will find that the powder contains small particles of a sandy material, which will feel harsh to the fingers, or scratch upon the plate. This sandy material is silica, of which there is a portion in every vegetable product. Besides this, there are in most vegetables carbonate of lime, carbonate of magnesia, alumine or clay, oxide of manganese, and oxide of iron, all which, along with the elemental gases, can be detected by chemical experiments. An eminent foreign chemist having performed an experiment of this nature on the seeds of wheat, rye, barley, oats, and straw of rye, two pounds of each, he discovered that they contained the following number of grains of earthy or metallic matter. We omit fractions:

	Wheat.	Rye.	Barley.	Oats.	Rye Straw.
Silica,........................	13	15	66	144	152
Carbonate of lime,.....	12	13	24	33	46
Carbonate of magnesia,.........	13	14	25	33	28
Alumine,....................	fraction.	1	4	4	3
Oxide of manganese,...........	5	3	6	6	6
Oxide of iron,.................	2	fraction.	3	4	2

It is probable that these proportions of earthy and metallic matter in vegetables will differ according to the nature of the ground; but we may feel assured of the fact, that they are less or more essential to artificial cropping; and unless supplied or compensated in some manner by the farmer, his fields will in time deteriorate in their fertilising virtues, notwithstanding the administration of putrescent manures. It is true that nothing in nature is ever struck out of existence, and that the earthy material of plants is deposited somewhere; but as it does not come back to the field whence it was removed, means must be adopted to supply its place.

The process of earthy restoration may be accomplished by scattering new materials upon the fields, and this might be easily accomplished in many parts of the country, so far as silica or fine sand is concerned, but the readiest and cheapest process in most situations will consist in trenching the subsoil, and gradually assimilating it to the mould above. The subsoil, or that portion of the under stratum which lies out of reach of the ordinary plough, may already be so good as to be available for bringing towards the surface, and in such cases it admits of easy and profitable management; but in most instances in our country, the subsoil is hard and stony, and will require to be trenched, and lie for a time in its underground position, before it is ready for mixing with the upper mould.

The most efficient instrument for trenching the subsoil on a large scale, is the subsoil-plough of Mr. Smith, of Deanston Works, near Stirling. When a field is to be trenched, a common plough, drawn by two horses, goes before, throwing out a large open furrow of the active soil. The subsoil-plough follows in the wake of the common plough, slits up thoroughly and breaks the bottom, and the next furrow of active soil is thrown over it. This large subsoil-plough is a kind of *horse-pick*, breaking up without raising the under stratum to the surface. The atmospheric air being by this means freely admitted to the subsoil, the most sterile and obdurate till becomes gradually meliorated, and the common plough may ever after be wrought to a depth of from ten to twelve inches without obstruction. For this heavy ploughing most likely three horses yoked abreast will be required. The charge for subsoil ploughing may be estimated at twenty-four to twenty shillings per statute acre, being one-fifth of what a similar depth with the spade would cost, and, upon the whole, be as effectually done. The expense of subsoil ploughing is no doubt considerable, but its advantages are incalculable. "All who have ever studied or experienced the most common gardening, must be aware of the important advantages of deep working; and when it can be attained in the broad field of farming at so small a cost, they may easily believe that the whole will be more than doubly repaid in every succeeding crop, and abundantly even in pasture. When land has been thoroughly drained, deeply wrought, and well manured, the most unpromising sterile soil becomes a deep rich loam, rivaling in fertility the best natural land of the country, and from being fitted for raising only scanty crops of common oats, will bear good crops of from 32 to 48 bushels of wheat, 30 to 40 bushels of beans, 40 to 66 bushels of barley, and from 48 to 70 bushels of early oats per statute acre, besides potatoes, turnips, mangel wurzel, and carrot, as green crops, and which all good agriculturists know are the abundant producers of the best manure. It is hardly possible to estimate all the advantages of dry and deep land. Every operation in husbandry is thereby facilitated and cheapened—less seed and less manure produce a full effect, the chances of a good and early tid* for sowing are greatly increased—a matter of great importance in our precarious climate—and there can be no doubt that even the climate itself will be much improved by the general prevalence of dry land. When this subject was treated of in 1833, the system was beginning to be adopted in a few places in a very few districts of Scotland, England, and Ireland, and in most instances on a very limited scale. Since then, the intrinsic merits and evident outspeaking results of the system have raised its character, even with many of its former opponents; and one cannot now travel almost any where in the country without seeing, either on a large or a small scale, the operation of thorough draining going on. The deep ploughing is not yet so general, but it will undoubtedly follow; and it is to be regretted that, in the meantime, some zealous and good farmers, not aware of its advantages, are filling their drains so near the surface as to mar the future thorough application of the system of deep working.

In making a survey of the agricultural aspect of Scotland, and great part of England, it must be evident to every one skilled in agriculture, that by much the greatest proportion of the arable land, indeed we may assume three fourths of the whole, is under very indifferent culture, arising mainly from the want of complete draining and deep working; and looking even to the best farmed districts with the eye of an experienced farmer in the thorough system, much of the land will be seen suffering under wet or damp. * * *

All the operations by the plough, the harrow, and similar instruments, are intended to loosen, pulverise, and mix the soil. The more effectually, therefore, that this can be done, so will the crops be the more productive. A plant, growing in a hard soil in its wild state, is always inferior in bulk to one which grows in a loosened or cultivated piece of earth. By cultivation, as every one knows, the character of plants is greatly changed and improved. The reason for this is, that the air and moisture, not to speak of manures, are enabled to reach the roots, and nourish their growth. Pursue this mode of improvement to its ultimate limits, and we shall find that the more completely we can deepen the soil and reduce it to powder, the more bulky will the plants become, and the more heavy will be their crops. The fertility of a ploughed field is from the earth which happens to be loosened and powdered; little or nothing is got from the clods. Let us hear old Jethro Tull on this subject:

"I have had the experience of a multitude of instances, which confirms it so far, that I am in no doubt that any soil (be it rich or poor) can ever be made too fine by tillage. For it is without dispute, that one cubical foot of this minute powder may have more internal superficies than a thousand cubical feet of the same or any other earth tilled in the common manner; and I believe no two arable earths in the world do exceed one another in their natural richness twenty times; that is, one cubical foot of the richest is not able to produce an equal quantity of vegetables, *cæteris paribus*, to twenty cubical feet of the poorest; therefore it is not strange that the poorest, when, by pulverising, it has obtained one hundred times the internal superficies of the rich untilled land, should exceed it in fertility; or, if a foot of the poorest was made to have twenty times the superficies of a foot of such rich land, the poorest might produce an equal quantity of vegetables with the rich. Besides, there is another extraordinary advantage when a soil has a larger internal superficies in a very little compass; for then the roots of plants in it are better supplied with nourishment, being nearer to them on all sides within reach, than it can be when the soil is less fine, as in common tillage; and the roots in the one must extend much farther than in the other; to reach an equal quantity of nourishment, they must range, and fill, perhaps, above twenty times more space, to collect the same quantity of food. But in this fine soil, the most weak and tender roots have free passage to the utmost of their extent, and have

* "Tid," a Scotch term for that state of the ploughed soil which is most suitable for receiving the seed—neither too moist nor too dry.

also an easy, due, and equal pressure every where, as in water."

It will be understood, from these explanations, that subsoil trenching—to increase the depth of permeable earth, and to supply the deficiency caused by the absorption of earthy substances by plants—is of great and lasting value. But to this ingenius process must be added that of thoroughly breaking the clods in the upper mould, and reducing the whole to a kind of powder. If the ordinary course of ploughing, cross-ploughing, and harrowing, be unable to break the lumps of hardened mould, it should, as far as possible, be done by hand-labour with mallets.* When the mould is pulverised and loose, it is a powerful absorbent of moisture from the atmosphere, and thus will nourish plants from mists and dews, in a far more effectual manner than if left in a concrete condition.

It would be easy to produce further evidence of the value of subsoil ploughing, for all the purposes to which we have adverted; but such testimony, we should think, can hardly be required, enough having been already said on the subject to convince the most sceptical, and to instruct the uninformed. We conclude with the following valuable observations, delivered by the Marquis of Tweeddale at the Inverness meeting of the Highland Agricultural Society, in 1859, and which refer to his lordship's own mode of management:

"The system I have adopted for the treatment of the lands of my own farm, where the soil and subsoil are of the weakest, is as follows: A great proportion of the land is valued at five and ten shillings per acre. After it is drained in grass, the land is trench-ploughed, making the furrow from fourteen to sixteen inches, the soil being turned into the bottom of the furrow. The ploughing is done by two ploughs, each having a pair of horses. As the work is harder upon the horses that turn up the hill, they every hour change with the plough that turns over the sod. The till remains exposed to the frost during the winter; in the spring the land is cross ploughed, the sod is found quite rotten, and mixes with the till. Oats are sown, and the crop is found considerably better than before the land was drained. After the crop is cut, the land is ridged up with a winter furrow, turnips being sown in spring. In ridging up the land for turnips, there is little or no appearance of till. The best crop of turnips to be found in the same district of the country, is not superior to that grown after this management of the land. The land, after the turnips are eaten off by sheep, is ploughed for barley; there is an excellent crop, and the grass seeds are always well planted during the two years of grass that follow the barley, the fields having the earliest grass crop in the district. The largest number of sheep are fed on them, and are the fattest animals. The grass that formerly grew on these fields was of the worst quality, and sheep would scarcely eat it. No extra manure or lime has been applied to these fields, except on a part of one of them, which remained six years without growing any thing an animal would eat, consequently it was left without stock. In the third year since it was in that state, it is growing as good a crop of turnips as can be seen in the country; and no stranger who saw the land in fallow would believe it to have been what the people of the country knew it to be previous to its improvement. It is evident that the only extra work in following out this system is trench-ploughing once; this, however, is done with the ordinary plough used for working the land, and the horses are never oppressed. It will be satisfactory to state, that I have an equal dread with other farmers to bring till, before the land is drained, to the surface. It is only after that operation is effectually executed, that I consider the till or subsoil, when properly pulverised, forms a new soil the most valuable and easy to work of any I know."

[* Or by horse-power with the clod-crusher.] [Ed. So. Pl.]

Items for Housekeepers.

If your flat irons are rough, rub them with fine salt, and it will make them smooth.

Oat straw is the best for filling beds; should be changed once a year.

If you are buying a carpet for a durability, choose small figures.

A bit of soap rubbed on the hinges of the door will prevent their creaking.

Scotch snuff, put on holes where crickets come out, will destroy them.

The Southern Planter.

RICHMOND, VIRGINIA.

Phosphates.

The manner in which we may best and most economically restore to our lands the amount of inorganic manures abstacted from the soil by a given number of bushels of grain produced upon an acre. becomes a very important subject of interst and inquiry to all good farmers--especially as we are, year after year, devoting more and more attention to the raising of small grains and grasses. Economy in manuring is as necessary for our thrift as its proper observance is essential in other arrangements of the farm to secure us anything to the credit side of the balance sheet. We do not expect to be understood in any other sense, when we speak of "economical manuring," than as cautioning against *waste* of fertilizing materials, either by any injudicious application, or neglect in husbanding our supplies. We shall have to rely principally, or at all events largely, upon "concentrated manures" as fertilizers—the high price and the constantly increasing demand for which warn us to make the most of them. We are compelled to use guano in a mode different from the old broad-casting method, or we shall receive a very small profit for a very short while. But if by means of "composts" (the guano being used as a constituent part of them always) we may make a manure suitable for using in a drill with which we may give to our wheat crop *ammonia enough and no more than it wants*, while we may *leave in the soil a greater supply of phosphatic and other mineral ingredients at a less cost than we pay for them in imported guanos*, we may reasonably expect a larger development of grain, and better stands of clover, with a steady and general improvement of our farms. We do not pretend to decide to whom the honor belongs, of having first originated the theory that eight per cent. of ammonia is enough for the wants of a growing crop; but we believe it. The gentlemen engaged in "*manipulating*" guano, always have in view the design of lessening the amount of ammonia contained in Peruvian guano, and increasing its value in phosphatic manures—contending for the economy of reducing the ammonia from 13 per cent. to 8, while the phosphates are largely increased, and put up to 40 or 45 per cent. They say we will secure in this manner more grain and less straw. This is an end which it is very desirable to attain. The guanos so treated, are very thoroughly ground and prepared, so as to make every ounce of them available, either for broad-casting or drilling. Each year that we raise large crops of grain or grass, we are exhausting the earth's supply of phosphatic lime. We must look, then, for some source from whence we can draw supplies of this all-important item of fertility, as we cannot, every year, haul out enough putrescent manure to supply the deficit caused by our increasing wheat crops. Two sources are presented to us in Bone-Dust, and the Nevassa, Sombrero, and other guanos. We acknowledge a preference for a phosphate obtained from bones, because we believe it to be more easily soluble, and consequently of more rapid and perfect assimilation for plant food. We think the time has come when it is necessary for us to arrive at some satisfactory conclusion on this point, by experiments and a free comparison of experiences. We refer our readers to the experiments reported in our June number by Messrs. Coombs, Minor, Anderson, Raine, Walton, Lacy and Staton, in response to the queries of Mr. S. T. Stuart, of Fairfax, page 345, and to the communication of "A Clarke County Farmer," in our present number, of his experience with "Rhodes' Super Phosphate," while we earnestly beg for the report of every gentleman on the merits of these articles, who has had experience with them—being, as a practical farmer, as deeply interested in the subject as any of our readers can be. We have seen one very strongly marked case of improvement of the soil, and increase of profits in a crop, from an application of "home-made" super phosphate, by a gentleman of this county. We regret that we have not yet received his receipt for making it, and his own report of his experiments with it; but we shall publish it as soon as we do, with the hope that all of our readers will try his recipe and report results.

Phosphatic guanos *may not* prove of as *immediate* benefit to growing crops as the bone dust, since they contain phosphate of lime as a mineral, rather than an animal product. We have no doubt that the mineral phosphates can be rendered much more immediately soluble (and available for a present crop in proportion as they are soluble) by trituration with strong acids, either the muriatic or sulphuric—the latter of which is generally used on the score of economy. Earth, too, has solvent powers of no weak order, and sustains to the crops she bears the relation of a "matrix," for the reception, germination, nutrition and watering of the seeds, until their full development is effected by her retaining the requisite supplies, to secure this end, of warmth, moisture, air, and manures reduced to their finest state of divisibility and solubility, which are furnished her either from natural or artificial sources. In fact the earth not only thus wins her title of "mother;" but she performs, for plants, what the stomach does for the animal economy in receiving, dissolving, and thoroughly preparing the food offered, by which it is reduced to the condition necessary for the wants of life.

We subjoin extracts from tables of analyses of different crops, that it may be seen how we abstract phosphatic manures from the soil.

1st. Tobacco. Liebig says "Tobacco requires only alkalies, and food containg nitrogen."

The diference in the quantity of phosphates extracted from the soil by wheat is as (for wheat) 97.7 to (for tobacco) 16.

The *roots of tobacco, as well as wheat, extract phosphates from the soil; but they restore them again*, because they are not essentially necessary to the development of the plant.

"Indian corn contains in 100 parts a per cent. of phosphoric acid equal to 44.87. Oats 18.19. Wheat 46. Buckwheat 50.07."

In the May number of the Planter, for 1857, will be found a thorough and interesting article, written by Professor Gilham, on Super Phosphate of Lime. We commend it to the attention of those who are interested in the subject.

For the benefit of new subscribers, we are strongly tempted to re-publish the Essay, and may do so at a future period.

To our Subscribers and Friends.

The Editor does not keep the books of "The Southern Planter," and consequently very seldom knows anything about the accounts therein--whether "due" or "over-due" stands alongside of anybody's name on the list. He is, however, glad to enjoy "the run of the cash drawer," and feels as lively an interest as any other member of the establishment---not excepting the printer or his devil--in keeping it well filled. He does not hesitate, therefore, to invoke the aid of friends to accomplish this desirable end. Almost every friend to our paper (we hope) *can influence several persons to become regular paying subscribers----and we want a host of just such men on our list.* Will they not at once occupy a position on our books, and receive therefor our thanks and best efforts to serve them acceptably?

In the meantime our old patrons who are in arrear, will *very greatly oblige, and aid us*, if they will at once remit the amounts due by them. We presume they can be subjected to little or no inconvenience by so doing, while we are sure they will, as a consequence, *feel better.* At all events—apart from the gratification we shall experience at such evidence of their recollection—we shall be in better condition for complying with that necessary, but often inconvenient rule of "pay for what you get"—which a man residing in, or around Richmond, is so often reminded of, and may not neglect.

We have written this much at the earnest request of the "book-keeper," and our task is Dun.

H. E. Watkins, Esq., of Farmville, has the accounts of subscribers residing in Prince Edward, Charlotte, Cumberland, and Buckingham counties, in his hands for collection.

Mr. Tho. B. Montague has our accounts for collection which are due in Goochland—and Mr. George C. Reid our bills for Norfolk City and county.

The Virginia Military Institute.

The liberality of Col. P. St. Geo. Cocke—the former President of the Virginia State Agricultural Society—has thrown into the funds of this institution $20,000---with which it is intended to endow a Professorship of Agriculture.

A great want in the education of young men—many of whom go from the college halls to take charge of farms---will thus be supplied. It is expected that Col. Cocke's noble lead will be followed by other generous spirits, who are alike interested in promoting the cultivation and advancement of Agricultural science.

We trust this fund may be largely added to, so that our State may have within her borders *the very best school*, in all our glorious Union, for the education of not only her own sons, but of those of her sister States. It is with the greatest pleasure we announce the appointment of Major Wm. Gilham to the new Professorship of Agriculture. Major G. is so well known to the citizens of our own State for his scientific attainments, his laborious, constant industry, his zeal in the cause of agriculture, together with the possession of all those accomplishments and traits of character which serve to constitute and adorn the scholar and gentleman, that his appointment will, we believe, greatly add to the prosperity and reputation of our already popular Military Institute.

Messrs. B. M. Rhodes & Co.

We call attention to the advertisement of these gentlemén, who give a legal warrantee of the thorough preparation and genuine quality of their "Super-Phosphate." Intending to keep it always up to the *present standard*, they authorize all their agents, in case of any failure on their part to do so, to refund to purchasers any money which they may have paid for the article manufactured by them. This is the proper course to follow. We commend it to the attention of all manufacturers of specific manures. Give us a fair statement of what your article is, and if it does not come up to representation, give us our money back. We will not then have so reasonable a fear, as we have at present, of being "humbugged."

Rural Register,

Published by Sands & Mills, Semi-monthly; each number containing sixteen 4to. pages. Price $1 00 per annum.

We have received the first number of this paper, which is under the Editorial management of Samuel Sands, Esq., who was for many years the Editor of the *American Farmer.* The paper is well printed and *well filled* with interesting matter. We shall be happy to place it on our exchange list, and most cordially wish Messrs. Sands & Mills abundant success in their enterprise.

Cosmopolitan Art Journal.

We return our thanks to the Publishers of this valuable and entertaining "Quarterly" for a copy of the last number, which contains its usual amount of matter to interest and instruct its renders,—besides engravings. The principal engraving in the number before us, is the American Eagle, watching the spirit of Washington, which is dedicated to the Ladies of the Mount Vernon Association.

The late Thomas Nelson of Hanover.

The following resolutions have been sent us for publication. In giving them a place in our columns, we cannot refrain from expressing our own deep sympathy with the family of the deceased, in their severe bereavement.

Captain Nelson was for many years a resident of this city, and at one time the Collector of Customs in our port. He commanded the admiration and enjoyed the esteem of many of our citizens, who knew his worth as a faithful public officer, a devout Christian, and high-toned gentleman.

"OBITUARY.

"At a regular meeting of the "Farmers' Club of the Forks of Hanover"—

"*Resolved*, That this Club has heard, with the deepest regret and sorrow, of the death of the late Mr. Thomas Nelson, of Oakland, a member of this Club, and tender their sincere sympathy to the widow and family of the deceased.

"*Resolved*, That we have ever esteemed him one of the brightest, most exemplary and useful of our members; and that, by his death, a vacancy has been created in society which can with great difficulty be filled.

"*Resolved*, That the Secretary be requested to send a copy of the above resolutions to the family of the deceased, and forward them to the *Southern Planter* and the other Richmond papers for publication."

American Institute, New York.

We tender our thanks to the "American Institute," of New York, for a handsomely bound and illustrated copy of their "Transactions," which we have recently received.

Campbell's Manual of Scientific and Practical Agriculture.

We spoke of the above work before we had seen it in print, from memory; we now speak of it with increased approbation after having seen it in print. We take pride in commending it, because in addition to its high merit as a standard manual both for the Farm and the School, it is a *Virginia work*—a superadded merit, other things being equal, which entitles it to the special patronage of Virginia farmers, and being also adapted in its matter to the peculiarities of Southern planting and farming, it deserves universal dissemination among Southern agriculturists.

We have been particularly struck with the concluding remarks of the author, and reproduce them here for the benefit of young farmers.

"CONCLUDING WORDS.

"In all parts of the brief outline here given, the author has aimed to be as concise as was consistent with clearness. Much that has been said was intended as merely suggestive. The leading design has been to present the great principles of Science closely connected with Agriculture, and to show how these principles are involved in the daily business of the farm.

"It is hoped that the young farmer will find some things so presented to his mind, as to inspire him with new ardour in his honourable profession; and, at the same time, enable him to pursue it with unwonted pleasure. No profession can ever give much mental pleasure or satisfaction to the man engaged in it, unless he has, first, a clear view of the principles which form the basis of his operations; and, secondly, a distinct understanding of the relation between these principles and his own practice.

"The life of the agriculturist, as well as that of men in other pursuits, may have its toils, its trials, its perplexities, and its disappointments; but it has, at the same time, rare sources of pleasure and comfort. In the first place, it is the most independent of all departments of industry. It is true there is a mutual dependence pervading all the classes of society, but none have to rely so little upon the capricious patronage of their fellow-men as the successful cultivators of the soil. Hence, they are less seldom tempted to resort to trickery and deception, than men in some other professions, in order to secure the favourable consideration of 'the public.'

"Again, every farmer may feel that he is a member of that class upon whom a country like ours is chiefly dependent for its wealth and prosperity. The farming interests lie at the foundation of our national greatness. A paralysis in this department would evidently result in a paralysis of every industrial and commercial pursuit throughout this broad land. The farmers nourish and enrich the nation.

"The land-holders of our country, too, are the conservators of the purest patriotism. They are always the most stable and reliable citizens of this, and every other land. No other class of the people have their interests so closely and completely identified with the general and permanent interests of every part of the country—none can be more warmly attached to their native soil—and none are found more ready at all times to raise the strong arm of resistance against every invasion of rights, from whatever source it may come; and yet, no class of our citizens are so conciliatory and conservative in all times of great political excitement. Such considerations give a dignity and importance to agricultural pursuits which few other professions can claim.

"Besides these more general relations of the farmer to society, which should cause him to feel no ordinary degree of satisfaction in the pursuit of his honourable calling, he has around him the more closely-associated interests of his own little 'republic' at home, in which he can ever find much to alleviate any vexations which may arise to mar his comfort. A well-tilled farm, with its appurtenances all skilfully arranged, and in good order—with its close, strong fences, its deeply-plowed fields, and its well-selected, well-fed, and comfortably-sheltered stock—presents to the mind of any man of taste, a most pleasing object of regard. How much, then, must that pleasure be heightened, when he can say: 'All these are my own!' If, in addition to this, the happy owner can look over his broad fields, and view every step taken in their improvement and culture, with the light of Science before his mind—if he can trace each effect back to its true cause—how much more elevated still must be his pleasure, and how much more complete his satisfaction!

"There is yet a higher view, which the intelligent tiller of the soil may take of all that he sees around him. When he beholds in the light and heat of the sun, in the air he breathes, and in the fertilizing shower, exhaustless sources of life and joy—when he has learned how nicely the balances of Nature have been adjusted in all her departments—his thoughts must often rise in gratitude to the all-wise Author of these beautiful and benevolent arrangements. In every breeze that sweeps across his fields—in every shower that waters the thirsty land—in the growth of every plant upon his soil—in every shaking leaf, and in every blooming flower by the wayside—Science has taught him to see, and seeing, to adore the hand of Omnipotence."

From the Southern Farmer.

We cheerfully comply with the request of Mr. Bagley, and will be glad to submit to our readers, through this journal, any information which may be communicated in further response to his inquiries. We append the editorial of the Southern Farmer, and also Mr. Bagley's article.—[Ed.

Tobacco Culture.

We have had several articles on the culture of tobacco in reference to the permanent improvement of the land, and the reader will find a very interesting one in to-day's paper from a planter of Lunenburg. Contrary to the general experience of the country, many planters contend that the tobacco crop is not incompatible with a general system of improvement. If this has ever been the case at all, it is perhaps only since the introduction of guano and other bought fertilizers. With the aid of these, it appears to be far more practicable now than in former times, when the tobacco crop required all the manure, on the farm, to pursue an ameliorating system. Moreover the prices of tobacco will justify a liberal expenditure in its cultivation.

The subject is certainly one of the highest importance to the agriculture of the State, especially to the Southern portion. Whether the crop is unfriendly to general improvement or not, it will continue to be grown. It is, therefore, a desideratum to know the best method of culture, combined with a gradual and progressive improvement of the soil. And intelligent planters could not confer a greater favor on the planting interest than in submitting their views and experience on the subject. We trust, therefore, there will be several responses to the call of Mr. Bagley.

The Southern Planter is requested by Mr. B. to ask the attention of its readers and correspondents to the subject.

Cultivation of Tobacco with Regard to Improvement.

Mr. Editor:—I am indebted to "J. G. P." of Nottoway and to "Cumberland" for the information they have been kind enough to impart in regard to the inquiries about the permanent improvement of tobacco land.

If I understand "J. G. P.," he advocates the five-shift rotation both for corn and tobacco. Will he be good enough to inform us if he puts his theory into operation? Suppose he has on his farm twenty good hands; now five acres to the hand for corn would requre one hundred acres for one field, and five shifts would require five hundred acres of his farm for corn, and two acres to the hand for tobacco would take forty acres, or two hundred acres for five lots appropriated to wheat and tobacco—thus making seven hundred acres of arable land in a farm to be cultivated by twenty hands. All will perceive that the labor required to keep so many fields well fenced in, and free from brushes and briers would be immense, to say nothing about other objections.

"Cumberland" recommends a three-field system, and making a new tobacco lot every year, seeding it in clover. Now, Mr. Editor, I do not feel competent to instruct others in a matter so important as this, but I see very plainly the system the planters are pursuing in our country is reckless and ruinous in the extreme, and will tend only to poverty and bankruptcy; and in writing this my object is only to have the opinions of others on a subject so important. I suggest a system like this: Make a new lot every year, by raising all the manure you can, and then apply about three hundred pounds of Peruvian guano and one hundred pounds of some phosphatic guano to the acre, next year seed this land in wheat, and about the last of March sow and harrow in not less than two gallons of clover seed to the acre in order to secure a good stand of clover and exclude all other growth. Let it remain in clover the next year, and then put it in corn to be followed by wheat, thus having two lots in wheat every year. Continue this rotation until you have made six lots and seeded them all to clover, or until you have improved all of your land as you may think best. But I give it as my opinion that the *sine qua non* to the improvement of land is first to lay it off, and plow in a manner to prevent washing. I do not mean the ordinary ineffectual and ridiculous mode of horizontal ditching and crooked corn rows, but a skillful, effectual and thorough system, for any other than such is worse than none, and I will here mention that after several year's experience, and after reflecting on this subject perhaps more than any other person in our part of the country at least, I have now adopted a mode which is somewhat new, and which I am convinced is more practical and does better than any plan with which I am acquainted. This is a subject, Mr. Editor, of the greatest importance. Will you request that several others give their opinions as to the best and most practical way of improving land, and increasing our crops? Will the *Southern Planter* be so kind as to copy and request correspondents to give us light on the subject, and let all give their names in full, and all who write on such subjects should. For instance, if I knew who J. G. P. is, I could make some inquiries about his farm, and might find ort whether or not his theory and practice correspond. Don't tell us about what you think; tell us what you are doing, and give us your names in order that we may judge for ourselves.

WM. M. BAGLEY.

Columbian Grove, July 15th, 1859.

From the Am. Journal of Science and Art, Vol. XXVII, July, 1859.

On Some Points of Agricultural Science.

BY SAMUEL W. JOHNSON,

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The Absorptive properties of Soils.—It has long been vaguely known, that the soil possesses a remarkable power of absorbing a great variety of bodies. How the soil absorbs odours (more properly the volatile matters that give the sensation of odour) has often been seen in the case of garments upon which the fetor of the American skunk has fallen. The Indians long ago taught that they might be "sweetened" by burying them in the earth; and indeed we are told that these people sweeten the carcass of the skunk by the same process to render it fit for eating. Dogs and foxes bury bones and meat in the ground, and afterward exhume them in a state of comparative freedom from offensive odour.*

In the older treatises on agronomy we find allusion made to the power of soils to absorb gases, and this power, especially as exercised toward carbonic acid and ammonia, has been assumed to be of much agricultural significance, although the lack of precise experimental knowledge as to its extent, has been confessed and lamented.

The absorptive power of the soil not only for odours and gases, but also for fixed matters carried into it in a state of solution, is illustrated in certain commonly occurring instances. Thus the wells in densely populated cities, or in the vicinity of barnyards, or filthy canals, remain sweet and pure for a greater or less period of time, though they must be constantly receiving waters that have been in contact with putrefying animal matters. The filtration of the foulest water through a thin stratum of loamy earth removes all unpleasant effluvium and taste.

In the year 1850, it became known through two interesting articles published in the Journal of the Royal Agricultural Society of England,† that the soil exerts an absorptive power toward certain substances, ammonia and potash especially, but not toward hydrochloric, nitric and sulphuric acids, so that if dilute solutions of hydrochlorate, nitrate, or sulphate of ammonia or potash are filtered through, or agitated with a certain quantity of soil, the salts are decomposed, the bases remain in insoluble combination with the soil, and the acids are found in the solution united for the most part to lime.

Previous to 1850, the absorbent power of the soil was explained as a result merely of the surface attraction of porous bodies. Thus Liebig in his "Chemistry applied to Agriculture and Physiology," referred the condensation of ammonia in soils, to the surface attraction of oxyd of iron, alumina and humus, compared this power of soils to that exhibited by charcoal, which absorbs 90 times its volume of ammonia gas, and evolves it again moistening with water. He also says, deciding from analogy, but in the absence of experimental data, and erroneously, *"the ammonia absorbed by the clay or ferruginous oxyds is separated by every shower of rain, and conveyed in solution to the soil."*

The separation of organic odours and colouring matters from foul water by contact with earth, has been considered analogous to the action of animal charcoal, by which, for example, beer and wine may be deprived of odour,* colour and taste, and to that

* It is well known that some surfaces have a much greater power of attaching odours to them than others. Every person has observed that woolen garments retain smells longer than cotton or linen ones, and it appears that the colour with which a cloth is dyed affects its retentiveness for some odours. It is a fact, as the writer has personally observed, that when a skunk has emitted its stench in the cellar of a house, the odour clings most perceptibly to *silver ware* which has been buried among napkins in the recesses of a "china closet" long after it has disappeared from every other article on the premises. It is probable that the soil, or some of its ingredients, "sweeten" a garment as above stated, by first effecting a transfer of the odorous matter from the surface, and then destroying it by oxydation in the same manner as operated by charcoal, and platinum black. See note in next column.

† "On the absorbent Power of Soils." By H. S. Thomson. Vol. xi, pp. 68—74; and "On the Power of Soils to absorb Manure." By J. Thomas Way, Consulting Chemist of the Royal Agricultural Society. Vol. xi, 317—380; also, vol. xiii, pp. 123—142

* Several years ago Stenhouse found that the disinfecting property of charcoal depends, not merely upon the condensation in its pores of odorous matters, but also upon their destruction by the condensed oxygen with which, doubtless, it is charged. The writer (after Stenhouse) has kept the carcass of a dead rat all summer long in the working room of the Yale Analytical Laboratory without its evolving any disagreeable effluvium, simply by burying it an inch deep in powdered charcoal. The only odour that is perceived, is a strong one of pure *ammonia*, and in time, all the putrefiable parts of the carcass disappear, the hair and bones only remaining. The animal matters enveloped in charcoal (or other highly porous body capable of condensing oxygen, as platinum black or platinum sponge; probably also most soils, especially those rich in humus) are completely oxydized to water, carbonic acid and ammonia (free ni-

of alumina which forms insoluble *lakes* with organic pigments.

Way, in his comprehensive investigations before alluded to, after studying separately as far as possible the absorptive effect of each ingredient of the soil, was led as a last resort to invetigate the relations of the silicates to saline solutions. The simple silicates he found ineffectual and had recourse therefore to the complex silicates. He digested feldspar with solution of chlorid of ammonium but detected no reaction, and thence concluded that the fragments of granitic rocks could not perceptibly decompose saline solutions. In order to trace the action of such silicates as are formed to a small degree in the wet way in soils by the weathering of the granitic minerals, Way next prepared double silicates of alumina with the bases potash, soda, lime, an ammonia respectively. In the first place he procured an alumina-potash, or alumina-soda-silicate, by precipitating the soluble alkali-silicate with a salt of alumina; on digesting these double silicates with solutions of lime and ammonia, he succeeded in replacing the potash and soda by lime and ammonia, though but incompletely, for different preparations of his alumina-ammonia-silicate contained but 4.51 to 5.64 per cent. of ammonia instead of the quality equivalent to the partly displaced alkali which, according to him, in case of the alumina-soda-silicate, should be 15.47 per cent.

Way gives as characteristic of this class of double silicates, that there is a regular order in which the commonest protoxyd bases replace each other. He arranges them in the following series:

Soda—Potash—Lime—Magnesia—Ammonia:

and according to him, potash can replace soda but not the other bases while ammonia replaces them all: or each base replaces those ranged to its left in the above series, but none of those on its right. Way remarks, that "of course the reverse of this action cannot occur." Prof. Liebig (Ann. de Chem. u. Phar., xciv, 380) has drawn attention to the fact that Way directly contradicts himself in describing the preparation of the potash-alumina-silicate, which may be obtained by digesting either the lime-alumina or soda-alumina-silicate in nitrate or sulphate of potash, when the soda or *lime* is dissolved out and replaced by potash.

Way was doubtless led into the error of assuming a fixed order of replacements by considering these exchanges of bases as regulated after the ordinary manifestations of chemical affinity. His own experiments abundantly show that among these silicates there is no inflexible order of decomposition, nor any *complete* replacements.

Liebig, in the paper just cited, was led from this contradiction and from other considerations, to reject the conclusions of Way, especially as there was no direct proof that these double silicates exist in soils.

The recent researches of Eichhorn,—"Ueber die Einwirkung verdünnter Salzlösungen auf Ackererde," (Landwirthschaftliches Centralblatt, 1858, ii, 169, and Pogg. Ann., No. 9, 1858,) have cleared up the discrepancies of Way's investigation (which is itself one of remarkable interest,) and have confirmed and explained his facts.

As Way's artificial silicates contained about 12 per cent. of water, the happy thought occurred to Eichhorn to test the action of saline solutions on native hydrous silicates. He accordingly instituted some trials on chabazite and natrolite, an abstract of which is here given.

On digesting finely pulverized chabazite with dilute solutions of chlorids of potassium, sodium, ammonium, lithium, barium, strontium, calcium, magnesium, and zinc, sulphate of magnesia, carbonates of soda and ammonia, and nitrate of cadmium, he found in every case that the basic element of these salts became a part of the silicate, while lime passed into the solution. The rapidity of the replacement varied exceedingly. The alkali-chlorides reacted evidently in two or three days. Chlorid of barium and nitrate of cadmium were slower

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trogen?) without the appearance of the intermediate and fetid products that occur in putrefaction. The sweetening of meat by charcoal (or earth?) consists in the oxydation (eremecausis) of the putrefying surface. Stenhouse found that platinized charcoal (charcoal ignited after moistening with chlorid of platinum) makes an excellent escharotic and disinfectant for foul ulcers, and latterly the surgeon is employing permanganate of potash—an energetic *oxydizing agent*—for the same purpose.—*Second Series, Vol. XXVIII, No.* 82.—*July*, 1859.

in their effect. Chlorides of zinc and strontium, at first, appeared not to react; but after twelve days, lime was found in the solution. Chlorid of magnesium was still tardier in replacing lime.

Four grams of powdered chabazite were digested with four grams chlorid of sodium and 400 cubic centimeters water for ten days. The composition of the original mineral (I,) and of the same after the action of chlorid of sodium (II,) were as follows:

	I.	II.
SiO_3,	47.44	48.31
Al_2O_3,	20.69	21.04
CaO,	10.37	6.65
KO,	0.65	0.64
NaO,	0.42	5.40
HO,	20.18	18.33
	99.75	100.37

Nearly one half the lime of the original mineral is replaced by soda. A loss of water also has occurred. The solution separated from the mineral, contained nothing but soda, lime and chlorine, and the latter in precisely its original quantity.

By acting on chabazite with dilute chlorid of ammonium (10 grams to 500 c. c. water) for ten days, the mineral was altered, and contained 3.33 per cent. of ammonia. Digested twenty-one days, the mineral, dried at 212°, yielded 6.94 per cent. of ammonia, and also had lost water.

These ammonia-chabazites lost no ammonia at 212°, it escaped only when the heat was raised so high that water began to be expelled; treated with warm solution of potash it was immediately evolved. The silicate appears to be slightly soluble in distilled water, the solution giving with solution of iodid of mercury in iodid of potassium, the yellow coloration indicative of ammonia.

As in the instances above cited, there occurred but a partial replacement of lime. Eichhorn made corresponding trials with solutions of carbonates of soda and ammonia, in order to ascertain whether the formation of a soluble salt of the displaced base limited the reaction; but the results were substantially the same as before, as shown by analyzing the residue after removing carbonate of lime by digestion in dilute acetic acid.

Eichhorn found that the artificial soda-chabazite re-exchanged soda for lime when digested in a solution of chlorid of calcium; in solution of chlorid of potassium both soda and lime were separted from it and replaced by potash. So, the ammonia-chabazite in solution of chlorid of calcium, exchanged ammonia for lime, and in solutions of chlorids of potassium and sodium, both ammonia and lime passed into the liquid. The ammonia-chabazite in solution of sulphate of magnesia, lost ammonia but not lime, though doubtless the latter base would have been found in the liquid had the digestion been continued longer.

It thus appears that in the case of chabazite all the protoxyd bases* may mutually replace each other, time being the only element of difference in the reactions. Natrolite, however, was not affected by digestion with chlorid of calcium. Eichhorn suggests that its soda is more firmly combined than that of chabazite.

These observations of Way and Eichhorn promise to yield the most fruitful results, not only to the theory of chemical geology, as elucidating the formation and alteration of minerals, but also to the science of agriculture. The explanation of the retentive power of soils which Way first proposed thus acquires an incalculable significance. It is plainly a true explanation, as now relieved from the constraint of a fixed order of affinities or replacements; though not the only or a complete explanation.

Voelcker, in some valuable researches on the absorbent power of a soil for the liquids of the dung-heap, (Journal Roy. Ag. Soc. of Eng., xviii, 149,) first showed that it is not always true that the bases displace *lime* from soils. He found to the contrary, in one instance, that lime was fixed and potash displaced. This result, as well as the opposite behaviour of ammonia-chabazite and natrolite towards solution of chlorid of calcium in Eichhorn's trials, indicate most clearly *that different silicates suffer different displacements, though in general, certain bases react more speedily and more*

* Eichhorn's observations indicate that the combined (basic?) *water* of a silicate is also liable to be increased or removed. May not the small amount of water of the many specimens of properly anhydrous minerals, be thus acquired? May not in some cases the loss by ignition in minerals, be due to ammonia that has entered into combination in the same manner?

largely or firmly retained than others. Obviously a great number of experiments are wanted on the behaviour of other silicates, native and artificial, towards saline solutions in various degrees of concentration, and at different temperatu.es, as well as in mixed solutions, before we can decide many interesting questions suggested by these results; but we have undeniably an important new generalization with reference to the reactions that may occur among minerals and in the soil.

Economy of the Ammonia naturally accumulated in the soil.—Since it has been proved that enormous quantities of ammonia exist in soils in a state of such intimate combination that the usual means (boiling with fixed caustic alkalies) fails to expel it,* the important question has arisen—how may this ammonia be rendered more rapidly available to vegetation than it is, so as in many cases to forestall the necessity for nitrogenous manures.

The displacement of ammonia from the ammonia-chabazite by potash, soda and lime, indicates a partial solution of this question; and may not the remarkably diverse effects of various saline manures, e. g. common salt, gypsum, sulphates of soda and magnesia, and silicate of potash, as well as carbonate and phosphate of lime, depend, to some degree, on reactions analogous to those above described! We know that very small doses of salt and gypsum, to take familiar examples, often remarkably enhance the productiveness of a soil, and as often fail to produce any good effect, either in small or large applications. Neither of the constituents of common salt is found to much extent in our usually cultivated plants, and soda is often entirely wanting.

The action of common salt and gypsum, especially of the latter, is most frequently similar to that caused by ammoniacal manures, whether these be applied to the soil or administered in gaseous form, as is now done in hot-houses by means of carbonate of ammonia, after the plan proposed by Ville, and is manifested in a more intensely green and luxuriant development of foliage, and increased content of water and of nitrogen. The "fixing power" of gypsum cannot longer be considered a useful quality of this fertilizer *in the soil*, not only because, in the merely moist soil, sulphate of ammonia would react on carbonate of lime, as Boussingault long ago demonstrated, but for the reason that the soil has itself a greater and more than sufficient power to fix ammonia, whether it be present as carbonate or sulphate. It is on the other hand the *unfixing* power of gypsum—its ability to liberate ammonia from the ammonia-silicates, that may in some cases constitute its merit.

General law of Displacement among Saline Fertilizers.—We are every day drifting further from what but a few years ago was considered one of the most fixed and beneficial principles of agricultural science, viz: that a substance is chiefly a fertilizer because it directly feeds the plant, and are learning from the numerous recent and carefully conducted experiments with manures, that in very many cases we cannot safely venture to predict what will be the influence of a given application; but find in practice the strangest and most discordant results, it being literally possible to show from the experience of the farm that almost every fertilizer in use has in some instances proved beneficial to every cultivated crop, and in other cases has been indifferent or even detrimental.

We are therefore compelled more and more to regard the *indirect action* of manures, and the principle brought out by the researches of Way and Eichhorn, appears adapted more than any other yet discovered to generalize the phenomena of indirect action, and enable us to foresee and explain them. Proofs are not wanting of the actual operation of this principle in the soil.

Wolff (Naturgesetzlichen Grundlagen des Ackerbaues, 3d ed. p. 148,) found in fact that the ashes of the straw of buckwheat grown with a large supply of common salt, compared with the ashes of the same part, of that plant grown on the same soil *minus* this addition, contained less chlorid of sodium but much more chlorid of potassium: there having occurred *an exchange of bases* in the soil.

The probabilities already adduced in

* In 1855 the writer found that there was no limit to the evolution of ammonia, when attempting to estimate it in soils, and Dr. Mayer (Ergebnisse. Ag. Chem. Versuche in Munchen 1 Heft.) could not recover by boiling with caustic potash nearly all the ammonia he purposely added to a soil.

favor of the view that ammonia is made available by gypsum, carbonate of lime, &c., are in point, and in the further course of this article other evidences will be brought forward to the same effect. May not the influence of lime and guano (or the carbonate of ammonia resulting from its decomposition,) in some cases be partly due to their fluxing the anhydrous or non-absorbent silicates of the soil, thus giving origin to absorbent silicates, as well as to their displacing effect on silicates already existing?

But it is of little use in the absence of decisive investigations to speculate on these topics except for the purpose of exciting research. A great field is opened here, and with this new clue to guide us it should be speedily explored.

Not merely the bases, but, as *a priori* would seem entirely reasonable, the acids also appear to be capable of similar exchanges and substitutions.

Way, Liebig and others, have repeatedly observed that phosphoric acid is absorbed by soils, and from the trials of Voelcker before referred to, it would appear that among the acids there occur displacements analogous to those established between the bases. Thus in one experiment in which the drainings of a manure heap were passed through a soil, there were found in an imperial gallon—

	Before filtration through the soil.	After filtration through the soil.
Silica,	·75	2·38
Phosphates of lime and iron,	7·90	1·54
Sulphate of lime,	2·18	7·92
Carbonate of lime,	17·46	79·72
Carbonate of magnesia,	12·83	6·17
" " potash,	85·27	4·29
Chloride of sodium,	22·85	18·90
" " potassium,	35·25	26·44

In another case were found.

	Before filtration through the soil.	After filtration through the soil.
Silica,	4·75	15·08
Phosphates of iron and lime,	36·32	33·14
Sulphate of lime,	7·14	*trace.*
Chlorid of sodium,	50·91	48·48
" " potassium,	30·32	39·49
Carbonate of potash,	148·69	85·93

The entire analyses have not been quoted, as I do not now intend to discuss these results fully, but merely wish to direct attention to the fact, that in both instances silicic acid (perhaps *only* as the result of an excess of carbonate of potash in the dung-liquor to which the soil was subjected) has been removed from the soil, and phosphoric acid has been fixed by it, while in one case sulphuric acid has been retained and chlorine lost by the soil, and in the other case the reverse has occurred.

Liebig, in the paper before referred to, remarks that "a clay or lime-soil poor in organic matter, withdraws all the potash and all the silicic acid from a solution of silicate of potash; whereas one rich in so-called humus (humic acid), extracts the potash, but *leaves the silicic acid* in solution."

Oxyd of iron and alumina, or some of their compounds which are at present in all soils, are the most obvious means of fixing the phosphoric acid of soluble phosphates, and Thenard (Compt. Rend. Feb. 1, 1858,) has experimentally demonstrated that they do remove phosphoric acid perfectly from solutions of phosphate of lime in water saturated with carbonic acid. Déhérain (quoted in Landwirthschaftliches Centralblatt, 1859, i, 94,) has shown on the other hand that carbonate of lime and ferric phosphate brought together with highly carbonated water, give rise to phosphate of lime and ferric carbonate. According to the same experimenter, phosphate of alumina and ferric phosphate are also decomposed by contact with solutions of the alkali-carbonates. Thenard, in the paper just cited, asserts that silicate of lime and phosphate of alumina decompose each other in carbonated water. However complicated and obscure these re-actions may be, it is plain, that, henceforth, *the effect of a solution of one base in displacing other bases from native hydrated aluminous (and ferric?) silicates, and of one acid upon the compounds of other acids with oxyd of iron and alumina, must be considered in the theory of the action of saline manures.*

Water as the medium by which the ingredients of the soil enter the plant.—From his experiments on the absorbent power of soils, Way was led to question the influence of water in effecting the distribution of plant-food in the soil, and Liebig in a recent paper on this subject (Uéber einige Eigenschaften der Ackerkrume" Ann. der Chem. u. Phar. cv., 109 et seq.*) has drawn the conclusion that this force in the soil is so powerful that ammonia, potash and phosphoric acid when applied as manures are instantly made quite insoluble, so that we must relinquish the idea hitherto entertained that plants appropriate their food directly from an aqueous solution, and must adopt as an only alternative the doctrine that the roots of the plant themselves attack and solve their nutriment. Liebig is of the opinion that the bodies mentioned cannot be distributed in the soil by the ascending and descending streams of moisture which are perpetually circulating in it, in obedience to gravitation and evaporation, and he adduces analyses of river, spring and drain-waters, which are almost free from potash and ammonia to sustain this view.

On the other hand Eichhorn in the paper already referred to, found that *pure distilled water dissolved from a soil much more of all the mineral matters required by vegetation than would be needful to supply any average crop.* Henneberg and Stohmann (über das Verhalten der Ackerkrume gegen Ammoniak u. Ammoniaksalzen, Ann. der Chem. u. Pharm. cvii., 170) found that when a soil had been saturated with ammonia, pure water removed it again to a certain extent. Thus 100 grams of soil were treated with 200 c. c. of a solution of chlorid of ammonium (containing 0·693 grams ammonia) and absorbed 0·112 grams of ammonia; on removing one-half of the solution and substituting as much pure water the soil lost 0·009 grams of ammonia as the result of the dilution: by again replacing with water 100 c. c. of the thus diluted solution, 0·014 grams of ammonia were re-dissolved from the soil, and by five repetitions of this process 0·053 grams or nearly one-half the quantity of ammonia originally absorbed passed again into solution.

Liebig himself in one of his papers (Ann. der Chem. u Pharm. cvi., 201,) has furnished the best illustration of the manner in which one base is made soluble by being displaced from its combination with the soil on the addition of another base. He says—"If sulphate of ammonia in very dilute solution, is brought in contact with soil saturated with silicate of potash, and which does not give up a trace (?) of its potash to water alone, it instantly dissolves a certain quantity of this alkali, which may be easily detected by the common reagents."

Liebig has not overlooked the case of acquatic plants whose roots do not enter any soil, for which, he remarks—"there must of course exist other laws for the absorption of their mineral food; they must absorb it from the surrounding medium."

But there appears to be no reason for supposing that acquatic plants differ from our cultivated crops in the manner of imbibing or appropriating the nourishment which enters the roots, especially since Sachs and Stoeckhardt (Chemischer Ackersmann 1859, p. 28, *et seq.*) have shown that the cereals and leguminous grains, as well as clover and beets, not only germinate but attain a vigorous development and even blossom; although their roots never come in contact with a solid soil, but merely float in water holding in solution the salts needful to supply them with mineral food.

It must be borne in mind that the amount of mineral (fixed) ingredients in a plant or crop is but a minute fraction (according to Boussingault 1–15,000th on the average, according to Lawes and Gibert 1–3,000th) of the quantity of water which a plant or crop under usual circumstances transpires during its season of growth. We are not surprised then that agricultural plants are sufficiently fed when their roots are merely surrounded by ordinary well water which is daily changed, or by distilled water mingled with a little vegetable ash into which carbonic acid is daily conducted. We know that drain tubes and aqueducts are often choked by a mass of

* See also his "Letters on Modern Agriculture," London, 1859.

rootlets which have grown from one little fiber that made its way into them through a narrow crevice, but why should the roots of trees and land plants thus develop in such water unless they find their food in it? In Stoeckhardt's experiments *loc. cit.*, it was observed that rye and oats only developed in a normal manner, in saline solutions, when these were diluted from six to ten thousand times! and young clover plants grew luxuriantly, putting forth new roots, leaves and blossoms in profusion, when transferred from the soil to pure water supplied with carbonic acid, to which was added 1–500th of clover ashes that had been neutralized with nitric acid.

It is true that most river and spring waters yield by analysis but the minutest traces of potash, ammonia and phosphoric acid, but we cannot, perhaps, infer with safety that they are actually so deficient in these ingredients, for it may easily happen, as all chemists know, that in the evaporation of a large mass of water traces of salts are likewise carried off,* and in the ignition of saline residues, as is customary in the analysis of a water, much more loss of potash may occur from the ready volatility of chlorid of potassium.

But admitting that our analyses are sufficiently accurate to base calculations upon, and that the soil-water never contains more potash for example than river and well waters; viz., from 2 to 10 parts in 1,000, 000,† it must be remembered that the plant is by no means compelled to limit itself for its supplies of mineral matter to that portion of water which it transpires.

The root-cells of a plant placed in a saline solution at once establish osmotic currents, in virtue of the mutual but unbalanced attractions that exist between the cell-walls, the liquid of the cell, the surrounding liquid and the saline and organic matters in solution in these liquids. The assimilating processes going on in the cells are constantly transporting matters forward into the newer growths; or else removing them from solution in the sap, and causing their deposition in the solid form. These are the prime disturbances that operate the currents, and to restore the matters thus removed from the liquids of the root-cells, external matters held in solution diffuse inwardly. If a plant has a large leaf surface exposed to the free air, from which water rapidly evaporates, water diffuses into the root-cells if it be present in the soil, and thus the normal humidity of the structure is preserved. But if the plant be situated in a close hot-house, or in a Ward's case, the atmosphere of which is constantly saturated with aqueous vapor, there can be no evaporation of water from the leaves, there can be no transpiration of water through the plant and no absorption of it by the roots, except to supply what becomes a solid constituent of the tissues or is decomposed in the nutritive process. The same is true of potash or any other substance held in solution in the soil-water. As a result of this principle the land plant collects the potash, phosphoric acid, silica, &c., needed for its organization, from the vastly dilute solutions of these bodies which form the water of wells or of the soil, just as the fucus gathers its iodine from the ocean, although the marvellously delicate reagents which we possess for iodine scarcely enable us to detect this substance even in highly concentrated sea-water.

Says Gmelin, (Handbook of Chemistry, Cavendish Soc's. ed., vol. ii, p. 248,) "the quantity of iodine contained in sea-water is so small that Tennant, Davy, Gaultier, Fyfe and Sarphati were not able to find it. Balard, however, found it in the water of the Mediterranean and Pfaff in that of the Baltic, which is nevertheless very poor in iodine." Otto (Lehrbuch 3d ed., 1st Part, p. 452,) observes "while bromine is easily found if not in sea-water itself, yet in the mother-liquors obtained by its evaporation, and is prepared from them in large quantities, it is still doubtful if iodine can be detected in them." Again, in a note—"It is worthy of remark that in preparing bromine from the mother-liquors of sea-water, iodine, so far as I know, has never made its appearance."

Iodine can be detected in a solution of which it forms but 1–300,000th part—Otto.

* In Liebig's Chemistry applied to Agriculture and Physiology (5th German ed., p. 102, et seq.,) may be found an account of some of the more striking instances of this volatilization. My friend, Dr. Robert A. Fisher, permits me to mention the result of some of his researches that bear on this point. He found, in fact, that a quantity (very small indeed but still sufficient to be estimated by volumetry) of *caustic potash* is carred off in the vapor when its aqueous solution is distilled.

†Eichhorn found in 1,000,000 parts of distilled water that had been in contact with a soil for ten days, 57 parts of potash.

The *selecting power* which is possessed by plants is fully explained and defined by osmotic diffusion. Within certain easy limits the plant imbibes only those kinds of matter and those quantities, which it requires to develop its organism, and which diffuse into it in consequence of assimilation in the cells. These limits are not so narrow or inflexible as to make the finding of the conditions of growth impossible, and within them, the plant lives and expands, but is itself influenced in its life and in the direction of its enlargement, by the quantities, absolute and relative, of the nutritive or soluble matters, that happen to surround it. Could we grow two plants in precisely identical conditions, we should find their composition alike in all their parts. The variations in the composition and amount of the ash of plants is probably connected with the different relative development of the separate organs, and this again (in part) with the relative quantities of food present in the soil-water. Thus the ash of the plant is, to a certain extent, independent of the soil, but again, to a certain extent, is affected by it. The absorption of *poisons* by plants is entirely abnormal and does not affect our statement.

Not only does the grand law of osmose (endosmose and exosmose) feed the plant out of such attenuated solutions, but, in all probability it aids the formation of these solutions. Graham has shown in the case of alum and bisulphate of potash, that the unequal diffusive tendency of the members of a double salt is powerful enough to decompose it, and he observed that solutions even of the neutral sulphates of potash and soda diffused their basic ingredients into lime-water, more rapidly than the acid; these stable salts thus undergoing partial decomposition.

The investigations of Henneberg and Stohmann already cited, have proved that the absorbent power of a sôil is not a purely chemical process, in the ordinary restricted sense; but is in part a physical phenomenon, i. e., it does not depend exclusively upon the presence in the soil, of a certain amount of some peculiar *kind* of matter, but is also related to the *condition* and to the relative amount of acting surface of the various materials which react.

Henneberg and Stohmann found that the *time of contact* between a solution of an ammonia-salt and a soil did not affect the amount of absorption,—as much ammonia being taken up in four hours as in a week. This fact indicates that the absorbing subsubstance is in an extreme state of division, to which the pulverized chabazite of Eichhorn's experiments can bear no comparison.

They found, too, that a given soil absorbed out of an equal volume of liquid very nearly the same amount of ammonia from equivalent quantities of all its salts, the *phosphate* excepted.

They observed, however, that the *relative quantities* of soil, water and the saline substance, affected the results; thus from a stronger solution a greater absolute amount of ammonia was absorbed, while from a weaker solution a relatively greater quantity was taken up: and further, relatively more was absorbed by a given amount of soil, from a solution of given strength when the *volume* of the latter was increased.

Finally they found, as has been already remarked, that by diluting with pure water the solution from which a soil had saturated itself with ammonia, a portion of this body is re-dissolved.

Thus it appears that the very surface-attractions which determine the solution of solid bodies, and occasion osmotic diffusion, also operate in the soil to influence the chemical affinities which are the prime cause of its absorptive properties. The chemical affinity of silicate of alumina for the bases, (probably too that of oxyd of iron and alumina for some of the acids) is modified by the mass of the reacting substances and by that of their solvent; or in other words, the cohesive force of the atoms of the compound silicates, or the adhesive force of water, (solvent action) for the saline bodies, may neutralize or limit the chemical affinity which determines one compound and give origin to another. Hence the chemical substitutions in the soil, and in the case of chabazite: hence, too, the perpetual presence of all the mineral food of plants in the water of the soil.

We would not by any means deny the direct action of the rootlets of plants upon the soil, an action which though exceedingly obscure and as Prof. Liebig remarks in enunciating his new views "very difficult to form a conception of," we may admit in some cases.

Liebig in his letters on modern agriculture, p. 43, gives this instance: "We frequently find in meadows smooth lime-stones with their surfaces covered with a network of small furrows. When these stones are newly taken out of the ground, we find that each furrow corresponds to a rootlet, which appears as if it had eaten its way into the stone." We may admit in this case that the rootlets have acted upon the stone, but are not therefore necessarily compelled to assume that the dissolved matters have entered the plant or were dissolved as food, for in such lime-soils the excess rather than the deficiency of carbonate of lime is oftener a hindrance to vegetation. In the case of the *Lycopodiaceæ* which contain *alumina* in large quantity combined with tartaric acid, (Berzelius) or malic acid (Ritthausen) we are, if any where, obliged to look to the plant itself, to account for the entrance into it of a substance absent from all cultivated plants if our numerous analyses are to be credited, and one which is rarely found in river waters, and then in quantity so small as to excite the suspicion that it has been introduced in the reagents, or came from suspended matters.

But it is evident from the facts that have been adduced that it is unnecessary to have recourse to any new theory to explain the access of the soil-ingredients into the plant. In fact it would appear that the view we have felt forced to sustain is the only one admissible in the present state of knowledge —the only one conformable to what we deem well established physical laws.

Conclusion.—The function of the soil.— While the researches of Eichhorn are of the utmost value in aid of the theory of the absorption of fertilizing matters by the soil, they do not suffice to give a full explanation of this process. Doubtless all the reactions that occur between hydrous silicates, sesquioxyds and saline solutions may take place in the soil; but in addition to these a number of other changes must go on there, as the soil is so complex and variable a mixture. The organic matters (the bodies of the humic acid group), which are often though not always present in no inconsiderable quantity in the water extract of fertile soils, can hardly fail to exert an influence to modify the action of the silicates. I have found that a peat (swamp-muck) from the neighborhood of New Haven, (containing when fully dry 68 per cent of organic matter) which is highly prized as a means of improving the porous hungry soils in this vicinity, and which when drained grows excellent crops, is capable of absorbing 1·3 per cent of ammonia, while ordinary soil absorbs but 0·5 to ·1 per cent.

The great beneficial law regulating these absorptions appears to admit of the following expression: *those bodies which are most rare and precious to the growing plant are by the soil converted into, and retained in, a condition not of absolute, but of relative insolubility, and are kept available to the plant by the continual circulation in the soil of the more abundant saline matters.*

The soil (speaking in the widest sense) is then not only the ultimate exhaustless source of mineral (fixed) food, to vegetation, but it is the storehouse and conservatory of this food, protecting its own resources from waste and from too rapid use, and converting the highly soluble matters of animal exuviæ as well as of artificial refuse (manures) into permanent supplies.

Yale Analytical Laboratory, May 15th, 1859.

Useful Information.

The washerwomen of Holland and Belgium, so proverbially clean, and who get up their linen so beautifully white, use refined borax as a washing powder, instead of soda, in the proportion of a large handful of borax powdered to about ten gallons of boiling water. They save in soap nearly one-half. All the large washing establishments adopt the same mode. For laces, cambric, &c., an extra quantity of the powder is used, and for crinolines (required to be made very stiff,) a strong solution is necessary. Borax being a neutral salt, does not, in the slightest degree, injure the texture of the linen; its effect is to soften the hardest water, and, therefore, it should be kept on every toilet table. To the taste it is rather sweet—is used for cleansing the hair, is an excellent dentrifice, and, in hot countries, is used with tartaric acid and bi-carbonate of soda as a cooling beverage. Good tea cannot be made from hard water, —all water can be made soft by adding a tea-spoonful of borax powdered to an ordinary sized kettle of water, in which it should boil. The saving in the quantity of tea used will be at least one-fifth. To give the black the flavour of the green tea, add a single leaf from the black currant tree.—*Scientific American.*

In the system of the universe every part is doubtless proportioned to the whole.

VIRGINIA STATE AGRICULTURAL SOCIETY.

PROCEEDINGS OF THE EXECUTIVE COMMITTEE.

At a quarterly meeting of the Executive Committee of the Virginia State Agricultural Society, held at the Exchange Hotel on Thursday evening the 26th July 1859,

PRESENT.

EDMUND RUFFIN, *President.*

Franklin Minor, R. H. Dulany, Colin Stokes, Hugh M. Nelson, B. F. Dew, Wm. Overton, W. C. Knight, Wm. G. Crenshaw, and Wm. T. Scott.

Mr. Crenshaw from the sub-committee appointed to receive proposals from, and negotiate with any cities, towns or Agricultural Societies of the State, in regard to the holding of the next Fair, submitted the following:

REPORT:

That no proposals from any city, town or society of the State had been received prior to the 16th of June last, when the President of the Virginia Central Society opened a correspondence with your Committee, proposing terms for a practical union with the State Society in holding its annual Fairs, upon the grounds of the Central Society. The terms offered to the State Society were such as for various reasons—disclosed in the following correspondence—could not be acceded to.

Your Committee knowing the decided and oft-repeated preference of the Executive Committee for Richmond as the place most suitable for holding the annual Fairs, and being themselves fully impressed with the importance of attaining so desirable an object, (if practicable) without detriment to the State Agricultural Society, submitted the various modifications which would be necessary to render the original proposition conformable to the constitution and acceptable to your Committee, and in view of the non-acceptance of the proposed changes, offered another distinct proposition, the terms of which will be found in their letter of June 21st.

Neither the modifications proposed nor the alternative offer of the Committee was acceptable to the President of the Society, but on the contrary, were both declared to be "utterly inadmissible." Yet, in further manifestation of the earnest desire of the Committee to effect an arrangement with the Central Society for holding the Fair, its President having emphatically declared, that the terms proposed by him, and adhered to in every particular except as to the duration of the contract, were more favorable than those which had been accepted, last year, by the United States Society, your Committee—having expressed their willingness to accede to similar terms—offered to unite with the Central Society on the basis of its contract with the United States Society, and to leave matters of detail involving departure from the terms of the contract to arbitration, so as effectually to secure the Central Society from any changes which would operate to its disadvantage. To this proposition your Committee have received no response, though they have seen from a communication to the "*Richmond Enquirer*" that the President of the Virginia Central Agricultural Society declares, "that we have had enough of foreign Societies, * * * and as the State Society has placed itself in that category, we have done with it." As the communication contains explanations, the benefit of which we would not deny to the writer, we append it to the correspondence.

Your Committee report further, That having been favored with an interview with the sub-Committee of the Union Agricultural Society of Petersburg, terms of union for holding the next Fair have been mutually agreed upon, and your Committee therefore recommend to the Executive Committee the adoption of the following resolution:

Resolved, That the sub-Committee be authorized to make a contract with the Union

Agricultural Society of Virginia and North Carolina for holding the Annual Fair in connection with them, on their grounds at Petersburg on the following basis:

The free admission of the members of both Societies to the grounds;—the Union Society to pay one thousand dollars towards the premium list, reserving one thousand dollars of the sum granted by Petersburg to them for the holding of Fairs, for the repairs of grounds, which are to be put in good order by them;—the State Society to have all receipts and gate fees, and pay all expenses and the balance of the premium list—the police to be furnished by the Union Society free of cost to us; and that all payments to the Union Society for membership fees be reserved to them. We submit the annexed correspondence:

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LABURNUM, June 16th, 1859.

DEAR SIR:

My engagements in Court have been such since I had the pleasure of an interview with you, that it has not been in my power to hold another, and, as the time for announcing the Fair is rapidly approaching, I have concluded that it is best to delay no longer for a personal interview, but to address you this note, stating the terms upon which I propose a practical union of the State and Central Agricultural Societies. They are—

1. That the State Society shall hold its Fairs upon the grounds of the Central Society, without liability for expenses or premiums.

2. The premiums to be awarded by the State Society. The subjects for premiums to be determined by the Committees of the two Societies, but the amount of the premiums to be controuled (if they desire) by the Central Society, which shall alone be responsible for the payment of the premiums. The Committees of Award to be appointed by the two Societies. [The Fairs to be held in the name of the State Society, which shall have the free use of all the facilities under the controul of the Central Society, but the local management, police, &c., to be under the exclusive controul of the Central Society.]

3. The State Society to hand over to the Central Society its present surplus fund, and to lend to the Central Society a sum equal to the principal of its annual surplus—say $12,000—upon a credit of ten years, to be secured by a lien upon the Fair Grounds of the Central Society, but no interest to be paid upon it while this agreement continues.

4. This agreement to continue for five years and to be renewable thereafter for five years, at the pleasure of the State Society, upon a release of the debt of $12,000.

Please to favor me with as prompt a reply as your convenience will permit.

I am, most respectfully, your ob'dt servant,

(Signed) JAS. LYONS.
President Va. C. A. S.

TO W. G. CRENSHAW, ESQ., *Chairman of the Committee of the State Agricultural Society.*

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OFFICE OF THE VA. STATE AG. SOC'Y,
Richmond June 21st, 1859.

JAMES LYONS, ESQ.,
President Virginia Cent. Ag. Society:

Dear Sir:—Your favor of the 16th instant, was duly received and—without loss of time—was referred to the Committee of the State Society, charged with the duty of making arrangements for holding the next Annual Fair. The most respectful consideration has been given to each of the substantive propositions submitted by you, with an earnest desire, on our part, that the negotiation now begun may be conducted to a mutually satisfactory adjustment of the terms on which "a practical union of the State and Central Societies" may be effected. We now proceed, in the spirit of courtesy and frankness, to answer your several propositions in their order.

1. Your offer to permit the State Society to "hold its Fairs upon the grounds of the Central Society without liability for expenses and premiums, considered in reference to such reasonable equivalent concessions on our part to the Central Society, as shall compensate for their remission to us of "liability for expenses and premiums" indicates a just and proper basis, or starting point, in relation to which all the minor details of a general arrangement may be conformably adjusted, and if such particulars can be so adjusted, we unhesitatingly express, in advance, the high satisfaction it will afford us to enter into the arrangement, so far as we can do so consistently with our constitutional powers, which are limited to

the present year, and further, to extend which, would be an assumption of the prerogatives of the Farmers' Assembly. (See Constitution, Sec 2.)

2. Your second proposition is in these words: "The premiums to be awarded by the State Society—the subjects for premiums to be determined by the committees of the two Societies, but the amount of the premiums to be controlled (if they desire) by the Central Society, which shall alone be responsible for the payment of the premiums. The Committees of Award to be appointed by the two Societies. [The Fair to be held in the name of the State Society, which shall have the free use of all the facilities under the control of the Central Society; but the local management, police, &c., to be under the exclusive control of the Central Society.]

Inasmuch as you propose to assume the whole responsibility for the payment of the premiums, we cheerfully accord to the Committee of your Society the privilege of concurrent action with that of our own in determining the subjects of premium and the appointment of the Committees of Award. With equal pleasure we surrender to the Society—if they shall desire it—the right to control the amount of premiums to be offered, with this proviso, however, *that the sums proposed as prizes shall not fall short of those embraced in the schedule of the State Society for its last Fair;* the privilege of *enlargement* being absolutely committed to the discretion of the Central Society. We accept as part of a general arrangement the free use of the facilities which are under the control of the Central Society, for holding the Fair in the name of the State Society, but, the remainder of the clause contained in crochets—"the local management, police, &c., to be under the exclusive control of the Central Society," being in contravention of the Constitution, which provides, Sec. III., Article 7th, that the President "shall appoint and have direction of all marshals and other agents required to carry out and give effect to the rules and regulations prescribed by the Executive Committee for the Annual Fair," we are necessitated by the paramount authority of that instrument to decline; nevertheless, we think the object of the Central Society can be *substantially* attained by conference with the President, whose appointments of agents for local management, police, &c., we venture to premise will be made in accordance with the wishes of the Central Society, agreeably to rules and regulations to be prescribed by the Executive Committee, and which, we doubt not, will be so constructed as to be in substantial harmony with the wishes of the Society, while they must conform to the IX. Section and 5th Article of the Constitution, and that such co-ordinate controul will be accorded to them as is not incompatible with the dignity, rights and obligations of the President while holding the Fair in the name of the State Society.

3. Your third proposition is, "The State Society to hand over to the Central Society its present surplus funds, and to lend to the Central Society a sum equal to the principal of its annual surplus, say $12,000, upon a credit of ten years, to be secured by a lien upon the Fair Grounds of the Central Society; but no interest to be paid upon it while the agreement continues.

In the 1st. Article of the XI. Section of the Constitution, it is provided that "all capital of the Society now or hereafter invested, shall be held a fund sacred to the cause of agricultural improvement, *of which the income only shall be subject to appropriation.*"

You will see in the above clause of the Constitution that the whole of your third proposition is without the sphere of our legal competency, and that the Farmer's Assembly only has authority in the premises; yet, we think there would be no objection on the part of the Executive Committee to recommend to the Farmers' Assembly to authorise such a loan as the one proposed, provided all other necessary arrangements could be satisfactorily made. And furthermore: as the Central Society proposes to release the State Society from responsibility for expenses and premiums, we deem it but just and reasonable, and coming within the scope of the powers of the Executive Committee to make it, that an allowance be made to the Central Society of an amount in money equivalent to the privilege to be reserved to the life and such of the annual members of the State Society as shall have paid their dues, namely: the privilege of free admittance for themselves and for their families daily to the exhibitions of the Society during the continuance of the Fair, and that the whole of the gate money and other incidental receipts of the Fair be deemed to constitute part of the said allowance, but not to include the initiation fees of new members, nor the payments for the dues of annual members: neither is it to imply the right of the Central Society to charge higher fees for the privilege of exhibiting and contending for premiums within the fair grounds than the State Society has hitherto received.

4. Your fourth specification to this effect: "This agreement to continue for five years, and to be renewable thereafter for five years at the pleasure of the State Society upon a release of the debt of $12,000," comes not within the constitutional competency of the Executive Committee; and must, therefore, be remitted to the consideration of the Farmers' Assembly.

Should the foregoing proposed modification of the terms proposed by you be deemed inadmissble, we would in further manifestation of our earnest desire to effect "the practical union of the Virginia State and Va. Central Agricultural Societies," by some other means more acceptable, submit the following alternative proposition:

Presuming that the city of Richmond will agree to furnish the police, or means to pay the expense of it; as has been done formerly on several occasions; the Virginia State Society proposes to hold *its* Fair this year on the grounds of, and in connection with the Virginia Central Society, upon their grounds being furnished to us in good and complete order. The Fair to be conducted at the expense, and the gate-money and other incidental receipts to enure to the use of the State Society; the basis on which it is to be conducted, being the same as of all the Society's previous Fairs, namely: Admission or gate fees to be 25 cents for each person not entitled to free admittance; and the admission of stock, and other subjects of exhibition offered by persons not wishing to become members, three dollars. The free admission of all life and such annual members as shall have paid their dues to be continued, and the free admittance of all members of the Central Society to be allowed on the same terms on which our own are admitted. The committee of arrangements for the Fair to consist of five persons, *two* of whom will be appointed on the nomination of the Executive Committee of the Virginia Central Society, an arrangement alike consistent with the requirements of the Constitution and with the objects which both of the Societies have in view.

The contingent fund of the Society being larger at this time than it was last year, the Executive Committee feel warranted in assuming larger pecuniary responsibility in conducting a Fair this year, than they were able to do then; in other words, they can afford to assume the risk of holding the Fair without the requirement of a guarantee of expenses.

We are, dear sir, with most respectful consideration, your obedient servants,

WM. G. CRENSHAW,
FRANKLIN MINOR,
FRANK G. RUFFIN,
CH. B. WILLIAMS,
} *Committee.*

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LABURNUM, June 22, 1859.

Gentlemen:—I had the honor to receive, this afternoon, your letter of the 21st, in reply to mine of the 16th, and I hope you will pardon me for saying that I read it with equal surprise and regret, disappointing as it does, utterly, the hope which I, in common with many others of its members and the friends generally of agriculture indulged, that the State Society would appropriate, at least, its surplus funds to "advance and improve the condition of agriculture, horticulture, the auxiliary mining and mechanic arts," as required by the second article of the first section of its constitution, and, to that end, would unite with the Central Society in holding a Fair.

In this regret and surprise, the gentlemen with whom I have the honor to be associated in the management of the Central Society, fully sympathize, and with the expression of it, I should close this note, but for the fact, that, while you graciously consent to accept every privilege we have offered you, and claim others of an extreme character, you decline to co-operate with the Central Society in holding a Fair, and refuse to aid it with the advance, or loan of a cent, upon the ground that the constitution of the State Society forbids you to do so, and conclude by gravely submitting a proposition in which you say, "presuming that the city of Richmond will agree to furnish the police or means to pay the expense of it, as it has done formerly on several occasions, the Virginia State Society propose to hold *its* (your emphasis) Fair this year upon the Fair Grounds of, and in connection with the Central Society, upon their grounds being furnished to us in good and complete order." "The gate-money and other incidental receipts to enure to the use of the State Society," forbidding us to charge more than 25 cents gate fee for each person. In other words, the State Society will consent to hold a Fair upon our grounds if the city of Richmond will furnish the police, and we will give it every cent of our receipts, even including the rent of our own booths and buildings.

It becomes me, therefore, in my opinion, to show that I have suggested nothing which is forbidden by your constitution, and why your proposition is deemed utterly inadmissible by the Executive Committee of the Central Society.

1st. As to the term of the contract proposed by me—you say that your power is limited to one year by the second section of your Constitution, and further, to extend which will be an assumption of the prerogatives of the Farmers' Assembly.

I confess that I do not perceive such prohibition in the Constitution. It is true that the second section provides that the State Society "shall hold an annual Fair at such time and place as the Farmers' Assembly shall designate," but adds, "or in default thereof, as may be designated by the Executive Committee." Now I understand you to concede, very properly, that "the Farmers' Assembly have the prerogative" of contracting for five years as I propose; for, otherwise, your making such a contract would not invade their prerogative, and such being the case, it seems clear that under the circumstances existing, you, as the Executive Committee, have the power, because "the default" provided for, has occurred for three years, I believe, (and probably will occur henceforward and forever,) and in such "default" you are clothed with the whole power of the Farmers' Assembly, not only by the very clause you quote, but by the 9th article of the 6th section, which expressly provides that all powers of the Society shall be transferred to the "Farmers' Assembly," and in default of being exercised by that body, shall devolve, provisionally, on the Executive Committee. The term of five years was proposed, however, because we deemed it beneficial to the State Society, and as it objects to it, we are quite ready to limit the contract to one year, if otherwise its terms be such that we can with any propriety accede to them.

2d. You refuse to allow the Central Society to have the control of the local management, police, &c., because the 7th section of the 3d article of your Constitution provides that your President "Shall appoint, and have the direction of all marshals and other agents required to carry out and give effect to the rules and regulations prescribed by the Executive Committee for the Annual Fair." Now, it is very obvious that this article pre-supposes that the State Society had a place at which to hold a Fair, over which it had complete control, and that the case actually existing is a *casus omissus*.

But the difficulty may be gotten over in two ways, viz: first by your Executive Committee prescribing "no rule or regulation for the Fair," except that you will hold it on our Fair Grounds, under such rules and regulations as we may prescribe, provided they be first seen and approved by your Executive Committee. Second, by your President's agreeing to appoint such persons to be marshals and agents as we may nominate to him, and to enforce the regulations which we may have prescribed.

As to our placing the large amount of property entrusted to us farther beyond our controul than this, it is impossible, with anything like fidelity to those of whom we are the agents, who look to us for the protection and preservation of their property from abuse or accidental destruction.

3d. You say that you cannot hand over to us your present surplus fund, nor lend us $12,000, the interest of it to be applied to the exigencies of the Fairs, because the 1st article of the 11th section of your Constitution provides that "all capital of the Society now or hereafter invested, shall be held a fund sacred to the cause of agricultural improvement, of which the income only shall be subject to appropriation," and, therefore, you add, "that the whole of your [my] third proposition is without the sphere of our competency, and that the Farmers' Assembly only has authority in the premises."

With all respect, I must be allowed to say that I do not understand this passage of your letter, especially when I read it in connection with the closing paragraph of that letter, in which you say that "the contingent fund of your Society is larger than it was last year, and the Executive Committee feel warranted in assuming larger pecuniary responsibility in conducting a Fair this year."

My third proposition was, that the State Society should hand over to the Central its present surplus funds, and lend to the Central Society $12,000. You reject the whole of it, because, as you say, it is beyond the sphere of your competency—making no discrimination between the transfer of a surplus fund and a loan of a part of your capital. What, then, have you to expend upon a Fair this year more than you had last, unless you mean to discriminate between surplus fund and contingent fund? which, I presume, you do not. Again: if you cannot appropriate your surplus fund, which I understand to be an annually accruing fund, not capital, and synonymous, therefore, with contingent funds, how can the Farmer's Assembly do so? inasmuch as it has the power to appropriate the income only, and you, the Executive Committee, have precisely the same power; or, you can incur no expense for a Fair, and the income of the State Society must be perpetually reinvested in stocks until it becomes a great monument of its efforts, "to improve and advance the condition of agriculture"—but a monument, I fear, too much resembling that which the first Napoleon erected at the "Hotel des Invalids"—built of the trophies which he had taken from his victims.

As to the loan, I presume, from your reply, that you misapprehended me. I did not propose that you should appropriate any part of your capital to the Central Society, but simply, that instead of lending the Central Society $720 per annum, of your surplus revenue, while you hold your Fair on our grounds, that you should lend the principal of that sum, upon ample security, demanding no interest upon it while using our grounds.

Can the Executive Committee make or change an investment? If they can, there is nothing, allow me to say with all respect, in your objection. If they cannot, then they must have kept all their surplus funds uninvested since the last meeting of the Farmers' Assembly, and so must continue them until its next meeting.

Permit me now to say a word or two as to your proposition to the Central Society.

First, you assume that the City of Richmond will provide the police for the Fair, or money to pay for it, and, assuming that, you say that the State Society will hold its Fair upon the grounds of the Central Society, if they are furnished to it in ample order, it receiving the gate-money and all other incidental profits, and having the entire controul of the Fair; and, in return for this use of our grounds, the State Society will appoint a Committee of Arrangements for the Fair, to consist of five persons, and allow the Central Society the privilege of *nominating* two of them!!!

Were it not for the high character which each of you sustain, I should regard this proposition as a wanton insult to the Central Society, intended to rebuke its presumption for proposing any connection with the State Society. I cannot permit myself to believe—nay, am absolutely forbidden to believe, that such was your motive, and I frankly confess, therefore, that I am utterly at a loss to conceive what could have prompted you to make such an offer. By the time the Fair is held, the property of the Central Society will be worth at least $30,000; its officers will have bestowed, and must continue to bestow, much of their time and attention upon it, and the injury to it, arising from the Fair, will not be repaired for less, probably, than $500. Do you really think the privilege of nominating two members of the Committee of Arrangements an equivalent for the use of such property under such circumstances, and that the State Society renders the aid to agriculture which is justly expected of it, when it avows that such a privilege is the only contribution it can make for the purpose of establishing a suitable place for the permanent exhibitions annually of the products of the farmers and graziers, the artists and mechanics of the State, when the consequence must be, that unless, without such aid from the State Society, such places can be established by the liberality of the people, and Virginia will never witness within her limits another Agricultural Fair or Cattle Show by her State Society? If such be your opinion, I must be allowed to say, most respectfully, that I differ widely from you; and time, I think, will show that a great majority of the other members of the State Society concur in opinion with me.

In concluding, allow me to repeat the deep regret which I and those with whom I have the honour to be associated, feel at the total frustration, as it seems at present, of our hopes that, in common with all the friends of agriculture in the State, and especially in Richmond, the Central Society would have found occasion for grateful acknowledgment to the State Society for its efficient encouragement of agriculture, the arts and manufactures, by a practical union with it in holding a great annual Fair at Richmond;—but to add that we shall still be most happy to be authorized to make such acknowledgement by a change of the views and policy of the State Society which will warrant it, and to say, therefore, that I shall, to the latest moment practicable, be happy to receive any communication from you to that effect.

I am, most respectfully, your ob't serv't,

JAS. LYONS,
President Va. C. A. S.

To Messrs. Wm. G. Crenshaw, Frank G. Ruffin, Franklin Minor, and Charles B. Williams, Committee of the State Agricultural Society.

Office of the Va. State Agr'l Soc'y,
Richmond, July 6th, 1859.

James Lyons, Esq.,
President Va. Central Agr'l Society:

Dear Sir.—Your letter of June 22d was received on the 28th, but owing to the indisposition of one member of the Committee and the absence of another, an earlier attention to its contents has been impracticable.

From the terms of your letter the Committee regret to ascertain that there is no hope of their holding a Fair of the State Society in concert with your own, and as a matter of course, of holding one at all in the city of Richmond this fall.

As you seem to have misapprehended somewhat the terms proposed by the State Society, as well as the tone with which they were submitted, it may not be amiss to give an outline of the correspondence, in the hope that such a recapitulation may aid in removing wrong impressions.

Your letter of June 16th proposes a practical union of the two societies upon the following basis:

That the State Society shall hold its Fairs on your grounds, but in *its* name, for the next five years, and award the premiums, but under your controul as to their amount;

That it shall give you its present surplus (contingent) fund; lend you $12,000 for ten years, without interest for five years; and at the end of five years make a gift of that sum, if the contract for holding the Fair on your grounds be renewed for another term of five years, at the expiration of the first term, in consideration whereof the free use of the facilities under the control of the Central Society is tendered to the State Society for holding its Fairs *in its own name*, while on the part of the Central Society you propose to pay the premiums; to controul their amount; and to retain the exclusive controul of the local management, police, &c., in your hands.

To this our Committee reply, accepting, (conditionally) your offer to pay the premiums and expenses, and conceding the right to controul the amount of the premiums, provided the sums proposed as prizes should not fall short of those offered by the Society last year; declining to accord to you the "*exclusive*" "local management, police," &c., because the Constitution of the State Society expressly imposes the responsibility on its President of appointing all agents required to carry out the rules and regulations of the Executive Committee in whom *this* power is vested, and by whom it cannot be renounced, but offering to grant your object *substantially* by appointing such agents as you might approve.

In regard to your demand of the present surplus (contingent) fund of the State Society, they agree in lieu thereof, to make you an allowance equal in amount to the privilege to be retained to the Life, and such of the Annual Members of the State Society, as shall be entitled thereto, of free admittance to the Fair Grounds, and to give you the entrance money of all the visitors, and the fees for exhibition, only stipulating that you shall charge our fee for exhibiting by those who are not members, thereby intending to exclude the sweepstake feature of charging ten per cent. on all exhibitors, which was introduced and charged by the United States Agricultural Society last fall; and *not* stipulating, as you allege, that you should be restricted in your charge on the entrance of visitors, this restriction applying only to ourselves, in the event of the acceptance of our alternative proposition to which we shall presently refer.

They decline—because the Constitution forbade them to accede to it—your demand or a loan of $12,000 for ten years, without interest for five years, and to become a gift at a future time, but propose to recommend to the Farmers' Assembly to authorize such loan on proper conditions; and they decline to make any arrangement for any term of years, because they had no right to do it.

In view of the possibility of these modifications being unsatisfactory to you, they further propose, alternatively, to hold the Fair at their own expense on your grounds, upon the basis of all their previous Fairs, and upon terms more favourable to you than Petersburg, accepted last year, and which they hoped would prove agreeable to you who had then agreed to give the United States Agricultural Society $12,000 to hold a Fair in Richmond; or, in other words, to guarantee them against loss to that extent. This hope they felt authorized to indulge, as they could not suppose that you held the interests of the State Society in less regard than those of the Society you paid so handsomely for accepting your liberal invitation.

Your last letter declines the modifications proposed to your first proposition, and rejects the alternative offer of the Committee. That letter proposes nothing new; and consists mainly of arguments against the positions of the Committee, which have not convinced them, and of inferences in which they do not concur. It is useless, therefore, to state its terms, especially as in an effort to do so they might unwittingly weaken its force. It is only deemed proper to notice that part of it in which you say that, "were it not for the high character which each of you sustain, I should regard their (alternative) proposition as a wanton insult to the Central Society, intended to rebuke its presumption for proposing any connection with that Society." Permit us to assure you, that so far from meaning such an outrage, we were actuated by an "earnest desire," courteously expressed, to unite with you on such terms as we thought conducive to your interests and ours; and as the Union Agricultural Society of Petersburg had last year accepted a less liberal proposition, and as you were not known to have been offended at the demand of $12,000 on the part of the United States Agricultural Society as the condition of *their* holding a Fair, we could not for a moment suppose that our offer to hold one in connection with you for nothing, could present any ground of offence or even of dissatisfaction.

Bear with us in making one other remark. In submitting to you our alternative proposition, we ventured to presume that the city of Richmond would furnish the police, &c., but did not intend to be understood as making that a condition precedent to our holding the Fair. We had just been considering your proposition to controul the local management, to furnish the police, &c., and did not doubt but that you expected in so doing the city would assist you as it had done last year; we thought, therefore, that on the supposition of our holding the Fair, and assuming the local management, and the payment of the premiums and expenses, the city would be as liberal to *us* as it had been to *you*, and as it had been to us on several former occasions.

We are, most respectfully,
Your obedient servants,
WM. G. CRENSHAW,
FRANK G. RUFFIN,
CH. B. WILLIAMS,
} *Committee.*

LABURNUM, July 9th, 1859.

Gentlemen.—I have the honour to acknowledge your favour of the 6th instant, in reply to mine of the 22d ult., and with this acknowledgement should close the correspondence between us, were it not for the singular errors which you have embodied in what you term your "recapitulation" of the correspondence, and another superadded in the close of your letter.

It is due to all parties concerned, but epecially to the Central Society, that those errors should be corrected, and with the correction of them, I shall close this correspondence on my part.

The errors are—

I. Mis-statement of the first clause of my proposal. That clause was: "That the State Society shall hold its Fairs upon the grounds of the Central Society, without liability for expenses or premiums." In re-stating it, you omit the last clause, from the word "without," inclusive.

II. Mis-statement of the third and fourth clauses of my proposal. The third clause was, that the State Society should hand over to the Central, its present surplus fund, and loan it $12,000, to be secured by a lien upon the Fair Grounds, but no interest to be charged, while the agreement continues, (that is, while the State Society uses the Fair Grounds of the Central Society.)

In re-stating it, you omit, wholly, to state the security proposed by us, and blend it with the fourth clause, making us, by your "recapitulation," ask of you a "gift" of $12,000, at the expiration of five years.

Now, the fourth clause does not ask of you a gift, or anything else, at the expiration of five years. Its language is: "This agreement to continue for five years, and be renewed at the pleasure of the State Society, upon a release of the debt of $12,000." The wonder to me is that gentlemen of your intelligence could interpret this language into an appeal to you to go beyond your Constitutional "sphere," and make us a gift, when it plainly, and simply, extends to "the State Society," (and not to you its present Committee,) the privilege of renewing the contract for five years, provided that it (not you, its present Committee,) shall pay $12,000 to the use and benefit of agriculture, for the privilege, if it avails itself of it. We were willing to bear the toils and burthens of Agricultural Fairs for five years, while the State Society reaped the honours, and held the hoarded funds; but we thought, and still think, that if we perform the task so satisfactorily that the State Society desired to renew the contract, it should, for the purpose of making our service more efficient, and our burthen lighter, pay at least $12,000 out of the $50,000, which the friends of agriculture and the arts and manufactures placed under its control for their benefit. And with all respect to you, we are of that opinion, and, indeed, find it more than difficult to conceive how the State Society could regard as a gift the expenditure by it in the cause of agriculture, of any portion of the funds which the friends of agriculture raised and put under its controul for the use and benefit of agriculture. Such expenditure by it being, in our opinion, nothing but an appropriation of a portion of the trust-fund to the uses and purposes of the trust, according to the intent and design of those who created it. In this opinion I should be most happy to have the concurrence of the State Society, because I believe the beneficent ends of its creation would be thereby attained, and the great cause of which we are all the humble servants, advanced and promoted. But, whether you concur with us in this opinion or not, I hope you are convinced that I did not suggest to you the high misdemeanor of violating your Constitution; and that your agitation in behalf the Constitution has been quieted. That you are satisfied that it was no invasion of your "sphere" of duty to suggest, that your principals and masters might renew a contract if they pleased to do so.

III. You say that you proposed to recommend to the Farmers' Assembly to make us a loan of $12,000 "upon proper conditions."

Pardon me for saying that you proposed no such thing, as you will see by referring to your letter. Your language in that letter is, "we think there would be no objection on the part of the Executive Committee to recommend to the Farmers' Assembly to authorize such a loan, provided all other necessary arrangements could be made." To my comprehension (in all respect I say it) this sounds much more like the tale of "The House that Jack built," than a recommendation by the Executive Committee to the Farmers' Assembly. You certainly declare nothing in it, but that you have a thought, from which fact you infer that the Executive Committee may have a corresponding or somewhat similar thought, but whether they would excogitate that thought into a recommendation to the Farmers' Assembly, or if they did what the nature of that recommendation would be, we are not advised, because no intimation is given of what is meant by "other necessary arrangements" to "be satisfactorily made." But what would a promise to make a recommendation to the Farmers' Assembly amount to, if you had made it? About as much as a resolve to make an eel pie without first complying with Mrs. Glass's sage maxim, viz: "First catch your eels—then skin them," &c. When did you have the felicity to catch a "Farmers' Assembly;" and when do you think you will enjoy it again? Never, probably, unless the love of their great cause shall stimulate the farmers to get it up, in order that it may afterwards get rid of itself. But what is to become of agriculture in the meantime, and what to be done with the funds which the people have raised for the benefit of agriculture? Are they to remain locked up in the coffers of the State

Society, as the vital principle of a nominal organization? Was it to accomplish such an object that the State Fair was removed from Richmond? I understand not; for the Executive Committee of the State Society avowed that it removed the Fair from Richmond, because its contingent fund was not adequate to the expenses of a Fair, and the principal could not be touched, and therefore, it could not hold a Fair at Richmond, unless Richmond would advance a sum, which, added to the contingent fund, would defray the expenses of the Fair; and yet, when the Central Society, (the child of Richmond,) comes forward and offers to do the very thing which you required, by furnishing you with all the means to hold a Fair, and paying all its expenses, if you will give it your surplus fund; you decline, and say "we have a thought, that the Executive Committee may have a thought, that the Farmers' Assembly (if it ever meets) ought to have a thought, that the thing ought to be done!"

So much for the errors of your "recapitulation." But to them you have added another, and yet more remarkable error, in the allegation that the Central Society did more for the United States Agricultural Society than it is willing to do for the State Society, having given the former $12,000 to hold a Fair, while it will not permit the State Society to hold one "for nothing.'

This is a most extraordinary error indeed, and a most remarkable mis-statement of the case. Let me state the case properly to you, and I entertain the most perfect confidence that you will, when you read it, confess your error. The case, properly stated, is this: The United States Agricultural Society offered a premium list of $10,000, and they consented to hold a Fair at Richmond if they were guaranteed against loss from that list, and the other necessary expenses of the Fair. This guarantee the Central Society agreed to give, provided it should not extend beyond $12,000. The United States Agricultural Society accepted the guarantee, with the proviso. The Fair was held, we paid the premium list and other expenses, and had about $600 left. Now, what does the Central Society offer to the State Society? Does it offer less than it did to the United States Agricultural Society? No. But, on the contrary, it offers not a guarantee limited to $12,000, but, intending to propose a premium list of $10,000, it offers the State Society an unlimited guarantee. It says to it, "Take our grounds, use all our facilities, hold the Fair, and award all the premiums in your name; we will be at all the trouble, and keep everything in order, and pay all expenses, (no matter how large,) including the premiums; while you shall receive all the honour and eclat, if any; and all that we ask in return is, that, to assist us in paying these expenses and premiums, you will contribute your "surplus fund." And, in the name of the great State Society of Virginia, not for the sake of agriculture, but in deference to certain constitutional doubts and scruples, you reject our offer! Now, I appeal to you as candid gentlemen, as I know you are, to answer this question: Did the Central Society offer more to the United States Society than it has offered to the State Society? And here let me add, that we claimed the controul of the premium list because we were afraid to entrust it to the State Society. One of the most important elements, if not the most important one, in a good Fair, is a large premium list; and one of the prominent causes of the failures of the State Society, has been the absence of that element, and a small premium list. We intended to avoid that error, and have a large premium list ($10,000 at least;) and, from the past action of the State Society, we inferred its future course, and were, therefore, not willing to trust it, unconditionally, with the premium list.

In conclusion, I beg leave to repeat the expression of the sincere regret which I, and those with whom I have the honour to be associated, feel at your determination, because the great cause of agriculture and the arts will suffer from it, we fear though we shall do all in our power to avert that consequence. Which of us is right the great body of the people must decide. And, as some of your officers or employees has furnished to the Examiner, or some one connected with it, (whose hostility to the Central Society is to me inexplicable,) an imperfect view of our correspondence, upon which an article, unjust to both parties, but especially to us, has been framed, I hope you will send to the Editor a complete copy of the correspondence, with a request that he will publish it, and I will cause copies of it to be sent to the Editors of the other papers for publication.

With great respect,

I am your obedient servant,

JAMES LYONS,

President Va. C. A. S.

To W. G. Crenshaw, F. G. Ruffin, C. B. Williams, Esqs.—*Committee.*

OFFICE OF THE VA. STATE AG. SOC'Y, Richmond, July 16th, 1859.

JAMES LYONS, ESQ.,

President of Va. Cent. Ag. Society.

Dear Sir:—We had not the pleasure to receive your letter of the 9th instant,* but having seen what purports to be a copy of it in the "Richmond Enquirer" of the 13th, we proceed to answer it through the same medium:

You call our attention to what you are pleased to term "the singular errors which (we) have embodied in what (we) term (our) 'recapitulation' of the correspondence between us and another superadded in the close of (our) letter."

In tracing an outline of a lengthy correspondence, it was not to be expected that there should be a full reiteration of all that had passed, but such a brief reference only to what had before been elaborately discussed as would serve as an index to the correspondence. Yet, if in condensing ours, we have in anything come short of the full measure of justice due to the Central Society, we sincerely regret it, while we disavow such intention, and profess our perfect willingness, as in duty bound, to stand corrected. You too, we doubt not, will confess to a reciprocal obligation in relation to the State Society.

We are sorry we left out the words in our reference to your first proposition, by the omission of which we incur the imputation of "mis-statement." But, if it was a "singular error" on our part to have done so, in not citing the words "*without liability for expenses and premiums,*" although we state distinctly in the next paragraph that "you propose to pay the premiums," (and the omission of the word "expenses" was merely accidental,) is it not truly marvellous that *you*, who are the first to complain, should have been the foremost to transgress your own rule, and should be found to have committed the self-same "singular error," when in attempting to restate *our* proposition *you* omit the important fact contained in the words "*the Fair to be conducted at the expense* of the State Society?" In other words—*with* "*liability for premiums and expenses.*" Yet you have done this, not once but twice in your letter of June 22d.

With respect to your second, third and fourth proposals, we refer to them and adopt them in their original form, as no restatement of them can add to their clearness, or make them more intelligible.

It is unfortunate in referring to them that we should have used the term "gift," to which you so much object, albeit we are not sensible of the impropriety of its use, even in the sense in which you understand it, for you were willing in consideration of the *interest* of the $12,000 to grant us the free use of your grounds, facilities, &c., for five years, but for the renewal of the contract for another equal term, you demand the surrender of the principal, in addition to the interest, without offering any additional consideration for it. Is it not plain then, that the surrender of a debt without consideration, is of the nature of a gift or something very near akin to it? But, if you will re-examine the passage of our letter in which the word occurs, you will at once perceive that we used it not in the absolute sense you supposed, but only in a qualified sense; for we say "at the end of

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* NOTE.—ARMORY, RICHMOND, July 18th, 1859—7 P. M.

Dear Sir:—I have just heard of a grave error on my part, which involves Mr. James Lyons in an apparent lack both of official and personal courtesy. Thus: Mr. Lyons sent to me from his residence in the country his last communication to your Executive Committee, with a note to send it to you. This note I did not see, it having dropped from the bundle without my notice. Thinking this was but a copy to be put on record, and that he had directly sent the original note to you, I rested quiet, not doubting but that all had been done rightly. I now learn that you never received, of course, the communication, nor did your Executive Committee see it until in the "Enquirer."

I lament this mistake the more because it involves Mr. Lyons, when, even to this moment, he knows not of the error; but I shall inform him in the morning.

I ask it as a favor that you will explain this to the several gentlemen composing your Executive Committee.

Most respectfully, yours.

C. DIMMOCK, Sec'y Va. C. A. S.

C. B. WILLIAMS, ESQ., *Sec'y Va. State Agricultural Society, Richmond.*

five years, make a *gift* of that sum if the contract for holding the Fair on your grounds be renewed," &c., "IN CONSIDERATION WHEREOF, the free use of all the facilities under the controul of the Central Society is tendered to the State Society for holding its Fairs *in its own name;* while on the part of the Central Society; you PROPOSE TO PAY THE PREMIUMS, to controul their amount, and to retain the exclusive controul of the local management, police, &c., in your hands." As well might it be maintained that the *free use* implied *the gratuitous use* of the Society's grounds, as that the *gift* of the $12,000 loan upon a certain contingency, and for a specified *consideration* implied an absolute donation. Under similar qualifications we understand you to use the word "lending," as it occurs in the following paragraph in your letter of the 22d ultimo, viz:

"I did not propose that you should appropriate any part of your capital to the Central Society, but simply that instead of LENDING the Central Society $720 per annum of surplus revenue while you hold your Fair on our grounds, you should lend the principal of that sum upon ample security, demanding no interest upon it while using our grounds."

Now as this paragraph reads, is it not a "mis-statement" of your own proposition? And, is it not perfectly manifest that you use the term "lending" as synonymous with "hand over," as its use occurs in this correspondence, and in an entirely different sense, too, from that in which the word "lend" is used by you in the same sentence?

The way being open for the correction of "mis-statements," we have to call your attention to one, and still another of yours, before we come to consider what you are pleased to call "a most extraordinary error" and "a most remakable mis-statement" on our part in relation to your arrangement last year with the United States Agricultural Society.

We cite, for remark, the following paragraph, bristling with a terminal accompaniment of admiration marks arrayed like the pegs upon a ten-pin alley:

"First, you assume that the City of Richmond will provide the police for the Fair, or money to pay for it, and, assuming that, you say that the State Society will hold its Fair upon the grounds of the Central Society, if they are furnished to it in ample order, it receiving the gate-money and all other incidental profits, and having the entire controul of the Fair; and, in return for this use of our grounds, the State Society will appoint a committee of arrangements for the Fair, to consist of five persons, and allow the Central Society the privilege of *nominating* two of them!!!"

We have already shown that you omitted the fact that the State Society proposed to conduct the Fair at its own expense; but, if you will turn to our proposition, you will find another "mis-statement" or two, which we doubt not you will, on second consideration, deem to be constituent elements of our proposition, too important to have been overlooked in determining what our offer really was.

1st. It was important to have stated that, upon the basis of our previous Fairs, stock and other subjects of exhibition offered by persons not wishing to become members, (for members pay nothing for entrance fees,) would be admitted to competition for the premiums of the Society simply by *one* payment of three dollars. The importance we attach to it is: It shows that *we pay* the premiums we offer out of the ordinary receipts of membership fees, gate fees, &c., without levying an excise of 10 per cent. of the amount of each premium offered, upon the exhibitors, for every article entered for competition, as was done by the United States Agricultural Society, conducting its Fair in connection with you and with your concurrence last Fall. A measure by which the funds were directly increased $1,500, and indirectly $2,000, the awards of premiums having been prevented to that extent—a new mode of encouraging and fostering agricultural improvement—the effect of which was to make the exhibitors, to the extent to which they were taxed, pay the premiums. Call you this "skinning of eels?" Or is it a "monument"—after your copy-right pattern—to signalize your peculiar care for and identification of interest with "the farmers and graziers, the artists and mechanics of the State," erected *a la Napoleon*, "of the trophies which you have taken from your victims?"

2d. It was of very great importance too, that you should not have overlooked and have omitted to mention *that we offered to allow free admittance of all the members of the Central Society on the same terms on which our own are admitted.*

You may consider this of so little moment as not to be worth mentioning as any part of the "return," we proposed to make you, for the use of your Grounds, but, however, that may be, we thought far otherwise. When we were treating with you, on the basis of your first offer, we said, "as the Central Society proposes to release the State Society from responsibility for expenses and premiums, we deem it but just and reasonable." * * * "that an allowance be made to the Central Society of an amount in money equivalent to the privilege to be reserved to the life" and annual members "of the State Society," and that the whole of the gate money and other incidental receipts of the Fair, be deemed to constitute part of said allowance.

You say, "the injury to your Grounds, arising from the Fair, will not be repaired for less, probably, than $500." But, will not the receipts of all the annual membership fees, received from the members of your Society, more than quadruple the amount?

Where, then, is the propriety of your taunting question—"Do you really think the privilege of nominating two members of a Committee of Arrangements an equivalent for the use of such property under such circumstances, and that the State Society renders the aid to agriculture which is justly expected of it, when it avows that such a privilege is the only contribution it can make for the purpose of establishing a suitable place for the permanent exhibitions annually of the products of the farmers and graziers, the artists and mechanics of the State, when the consequence must be, that unless, without such aid from the State Society, such places can be established by the liberality of the people, and Virginia will never witness within her limits another Agricultural Fair or Cattle Show by her State Society.

We answer your question by asking another. When and where has the State Society avowed that such a privilege is the only contribution it can make for the purpose of establishing, &c.? and do *you* really think that we have offered you no other return for the use of your grounds than the privilege of *nominating* two members of the Committee of Arrangements?

Having now disposed of *your* "mis-statements," we will proceed to pay our respects to the concluding part of your letter, which has reference to what you term ours.

We are charged with a "yet more remarkable error in the allegation that the Central Society did more for the United States Agricultural Society than it is willing to do for the State Society, having given the former $12,000 to hold a Fair (omitting our explanatory clause, 'in other words, to guarantee them against loss to that extent,') while it will not permit the State Society to hold one for nothing." "This," you say, "is a most extrordinary error, indeed, and a most remarkable mis-statement of the case." "The case properly stated," you add, "is this: The United States Agricultural Society offered a premium list of $10,000, and they consented to hold a Fair at Richmond, if they were guaranteed against loss from that list, and other necessary expenses of the Fair. This guarantee of the Central Society agreed to give, provided it should not extend beyond $12,000. The United States Agricultural Society accepted the guarantee with the proviso. The Fair was held, we paid the premium list and other necessary expenses, and had about $600 left. Now, what does the Central Society offer to the State Society? Does it offer less than it did to the United States' Society? No. But, on the contrary, it offers not a guarantee limited to $12,000, but (intending to propose a premium list of $10,000,) it offers to the State Society an unlimited guarantee. It says to it, "take our grounds, use all our facilities, hold the Fair, and award the premiums in your name; we will take all the trouble, keep everything in order, and pay all expenses (no matter how large), including the premiums, while you shall receive all the honor and eclat, if any, [and if none, what? why the *mere name of holding a Fair!*] And all that we ask in return is, that to assist us in paying these expenses and premiums, you will contribute your surplus funds." In other words—although you had just said that you offered the State Society an unlimited guarantee, paying all expenses, &c., (no matter how large,) we must, to assist you in paying. &c., just allow you to "*eat the malt that lay in the house that Jack built.*"

Let us now stop and subject all this to the test of analysis. You ask, "what does the Central Society offer to the State Society? Does it offer less than it did to the United States Society?" *You* answer "No." *We* *say* the offer was far less favorable to the State Society—in this: that you demanded the whole of its surplus fund, amounting to between three and four thousand dollars, while from the United States Society you asked *not one cent!* "But," you continue, "on the contrary, it offers not a guarantee of $12,000," "but it offers to the State Society an unlimited guarantee," &c. Why, then, if this offer was not less than that made to the United States Society, are you unwilling that the State Society should hold a Fair on the same terms? or, on the offer of the State Society to hold it on the same terms, *minus any guarantee at all?* Are we not justified in saying, you held the interest of the United States Society in higher regard than you did that of the State Society?—But this is not all. You engaged to do yet more—even to "hand over" to them your "*surplus funds*," after defraying all necessary expenses and premiums, not even retaining the receipts from membership fees, paid by the annual members.

This abundantly appears, from your contract with the United States Society, setting forth that the Virginia Central Society pledged itself to pay "all the premiums and other necessary expenses of the United States Agricultural Society, provided the amount should not exceed the sum of $12,000, and to pay over to it the surplus (if any) arising from the gate and entry fees, and fees of membership, paid by the annual members, after deducting all the expenses of the Fair, including premiums." It further appears, that so the President of the United States Society understood it, who, in his letter to you, (see Richmond "Enquirer" January 19, 1859,) remarked: "The basis of all our negotiations has been, that the United States Society were to bring all the weight of its 'PRESTIGE,' its 'machinery,' and the service of its officers, to the aid of the Virginia Central Society in advancing the success of the Fair; and, in return, were to receive, in addition to their premiums and necessary expenses, whatever surplus might remain after defraying the necessary expenses of the Fair." Now, the whole matter resolves itself into this: that the better arrangements offered us, required of us to pay fully one-fourth of all the premiums and expenses, under the specious delusion of an "unlimited guarantee," while the worse arrangement (and worse, indeed, it was to you,) offered to the United State Agricultural Society, not only the guarantee of $12,000, but also to pay over to them *the surplus profits* arising from holding the Fair.

You appeal to us "as candid gentlemen," to answer this question: "Did the Central Society offer more to the United States Society than it offered the State Society?" We have answered it in anticipation and with all candor, that you did; nevertheless, as on this point we seem to misapprehend each other, if you are desirous of accommodating the State Society with terms *equal* to those accepted by the United States Society, the whole matter is compressed within the compass of a nut-shell, and may not after all be difficult of solution.

We propose, then, to unite with you on the basis of your contract with the United States Society, and if any of the details of the contract cannot be reconciled with the requirement of our Constitution, we are ready to submit to the adjudication of disinterested persons mutually chosen, the adjustment of the details in all cases of departure from those embraced in the said contract, so as to substitute others which shall in no event operate to the disadvantage of the Central Society.

In conclusion, we express the hope that you will not decline the proposed union upon the basis indicated, and that arrangements may be speedily made for issuing the Programme of a Fair to be held on your Grounds in October.

We remain, dear sir, with respectful consideration, your obedient servants,

WM. G. CRENSHAW,
FRANK G. RUFFIN, } *Committee.*
CH. B. WILLIAMS,

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LABURNUM, July 20, 1859.

To the Editors of the Enquirer:

GENTLEMEN.—I have just read in your paper, the resume of the Executive Committee of the State Agricultural Society, which, professing to be a reply to my last note, is a laboured attempt to draw off attention from its own errors, by a great outcry over certain omissions and inaccuracies. In mercy to you and your readers, I shall not review this last work of the Committee nor even point out its numerous errors and fallacies, because I am sure that even the casual reader will be struck with its beauties and sensible of its errors on the first reading. My purpose is simply to put myself right, in respect to one matter, over which the Committee rejoice much, as over a detected error, and to confess some of the "manifold sins and wickednesses," which they ascribe to me.

The first matter is the use of the word "lending," instead of the word "handing," in speaking of the annual surplus of $720. The word which I used was "handing," making the paragraph read, "In stead of handing to the Central Society $720 per annum, &c., you should lend the principal of that sum."

But, as you know, I write unfortunately a bad hand, and one difficult to read, especially when I write rapidly, as I generally do, and in copying my letter, the copyist made "lending" of "handing," and it escaped my observation. In doing this, (for which he is in no wise censurable,) the copyist made me mis-state my own proposal and make it absurd; and I do not perceive that it is at all relieved of that quality by the remarkable assumption of the Committee that lending and handing were used as synonymous terms. In the next place I have to confess my error in failing to comment upon the proposal of the Committee to permit the members of the Central Society to enter their own Fair Grounds during the Fair upon the same terms upon which the members of the State Society should be admitted. I did not notice this offer, because, as the Committee say, I considered it "of so little moment as not to be worth mentioning," and because it really seemed to me to be so ludicrous that I supposeed it was a lapse of the pen. In this, also, I have to confess that I was in error, for the Committee now assure me that the proposal was gravely made and "far otherwise" than unimportant; and I now perceive its merits and really confess that it partakes of that high order of wit which gives notice of its presence to the astounded listener by the peal which follows the unseen flash, and which rolls through the whole essay of the Committee like a pondrous ball over a ten-pin alley stuck full of pegs.

Indeed, it is quite equal to the best of Jerremy Didler or Beau Hickman, when the one was seeking information and the other a dinner. If I had been as well informed then as I am now, I should not only have noticed it, but certainly honoured it with "a terminal accompaniment of admiration marks, arranged like the pegs upon a ten-pin alley;" but the truth is, that my poor learning had not instructed me that a ten-pin alley had pegs on it arranged like pins; or that there was such a thing as "a terminal accompaniment." I will never be caught in the same fix again, however, for whenever I roll a ball over a ten-pin alley I shall keep a bright look out that it encounters none of the pegs; and I am sure I shall never hear a deep-mouthed fox-hound open upon the trail, or think of the Executive Committee, without recollecting that there is such a thing as "a terminal accompaniment"—and thus instructed, I will examine, for a moment, the last view of "a terminal accompaniment," presented by the Committee in its proposal to take the place and attitude of the United States Agricultural Society; and to refer to a board of arbitrators the settlement of all disputed details, after a deliberate effort to arouse old prejudices against that Society, by denouncing it as an eel-skinning concern, and then to transfer the prejudice to the Central Society.

Forbearing to say of this proposal many things which my learning in the new lingo of "terminal accompaniment" suggests, I content myself with saying, that we have had enough of foreign Societies, (though I mean not to reflect upon the United States Society;) and, as the State Society has placed itself in that category, we have done with it. We shall never again seek the aid of a foreign Society to promote the cause of Agriculture in Virginia. The people of Virginia will sustain us, and, if they do not, the generous people of Richmond, to whose paternal care we owe our being, will. Of course we decline the tip end of the "terminal accompaniment"—the reference; because, as we cannot surrender ourselves to the foreigner, we cannot authorize others thus to surrender us; and, because the reference must be obviously unequal, and therefore unfair. The Committee have already declared that they cannot accept our terms because of their constitutional difficulties, and in just respect to them, I am bound to suppose that those difficulties would not be removed by the opinion of a Board, and the reference would amount, therefore, to nothing more than the enquiry, whether the terms proposed by the State Committee should be accepted or not, excluding all consideration of our terms. This is "a terminal accompaniment," hanging altogether on one side. But we have no authority to refer to a Board to decide how we shall discharge the trust which has been reposed in us. That would be, illegally, to delegate to others the power which has been delegated to us. This may be within the "constitutional sphere" of the Executive Committee of the State Society, but it is not within ours. I must say, therefore, to our foreign friends, we shall continue our efforts, unaided by them, to give annually a Fair and Cattle Show which shall advance the great cause of agriculture and the arts, and reflect some credit on our State, and we hope to meet them there as our guests.

JAMES LYONS,
President Va. Central Agr'l Soc'y.

The report and accompanying resolutions were accepted and unanimously adopted.

The Committee adjourned until to-morrow morning at half-past 8 o'clock.

WEDNESDAY MORNING, July 27th.

The Executive Committee met pursuant to adjournment.

PRESENT,

EDMUND RUFFIN, *President*,

Minor, Dulany, Scott, Stokes, Crenshaw, Nelson, and Overton.

On motion of Mr. Dulany, the following preamble and resolution were unanimously adopted:

Regarding it as highly important that the members of the State Agricultural Society shall clearly understand the various propositions which have recently passed between their Executive Committee and that of the Virginia Central Society, and also the great necessity there is for procuring another meeting of the Farmers' Assembly, therefore,

Resolved, That a Committee of three be appointed to address a circular letter to the members of the Society, setting forth briefly the several propositions of the Central Society and the State Society for a Fair in Richmond and urging the members of our Society to elect delegates to the Farmers' Assembly, and to exert themselves to obtain a full meeting of that body, and a large attendance of the Farmers generally at the Fair to be held in Petersburg.

Committee, R. H. Dulany, F. Minor, W. G. Crenshaw.

The premium list was examined, revised and adopted, and its publication ordered in the usual manner.

On motion of Mr. Minor,

Resolved, That, hereafter, the subjects of experiments, Essays and other written Communications offered for premiums at the annual fair be referred to the Executive Committee, who may retain them for careful examination and comparison, until the quarterly meeting in January next following, when they shall announce their awards if agreed upon, or hold them for further consideration until the next stated meeting thereafter if they shall think proper to do so.

The Secretary communicated the resignation of Col. Wm. Townes as a Vice President of the Society, which was accepted, and thereupon Lewis E. Harvie, Esq., was elected Vice President to fill the vacancy.

On motion of Mr. E. Ruffin, the following "Special Premium" was ordered to be added to the schedule adopted for the next Fair:

SPECIAL PREMIUMS

For the successful and economical application, in actual operation, of steam-power to tillage purposes, as a substitute for team or animal power—to drain, and to work plows, harrows, rollers, clod-crushers, or any substitutes thereof, operating either to break, subvert, or pulverize the soil, or otherwise to prepare it for putting in seed, or for the production of crops on level or moderately undulating land—a premium of $500.

As conditions necessary for competing for, or obtaining this premium, it shall be required by the judges that full trials shall be made of the implements or machines offered, in practical labours and performance, and for as much time, before or after the annual exhibition as shall be deemed proper by the committee. And also that the operation shall be considered economical and profitable, and more so than the use of team labour for the same purposes, and on fields not less than fifty acres of size.

Should there be more than one machine competing for this premium, it will be awarded to the best, (if deserving it by sufficient merit,)—or if two be deemed deserving and of equal claims of merit, the premium shall be divided equally between them.

Any person designing to compete must notify the Secretary of the Society (at Richmond, Va.,) of his intention at least forty days before the Exhibition, and he will then be notified when and where (on James river,) the machine must be brought and tried. It must also be exhibited on the Fair Grounds during the Exhibition.

WILLIAM B. HARRISON,
WILLIAM C. KNIGHT,
ROBERT DOUTHAT,
JOHN A. SELDEN,
RICHARD IRBY,
W. W. GILMER,
EDMUND RUFFIN, JR.,
} *Com'tee.*

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ANNUAL REPORT.

The Secretary was directed to prepare the Annual Report of the Executive Committee.

COMMITTEE OF ARRANGEMENTS.

Messrs. Wm. C. Knight, Wm. T. Scott, Colin Stokes, and Ch. B. Williams, were appointed the Committee of arrangements to act in concert with the Executive Committee of the Union Society in making all needed preparations for holding the Fair, the meeting of the Farmers' Assembly and the section or general meetings of the Society.

The Executive Committee then adjourned to meet at Bollingbrook Hotel, Petersburg, on Monday evening the 31st of October, at 7 o'clock P. M.

CH. B. WILLIAMS, *Sec'y.*

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

VOL. XIX. RICHMOND, VA., SEPTEMBER, 1859. No. 9.

Proceedings in the Laboratory.

By PROFESSOR ANDERSON, M. D., *Chemist to the Highland and Agricultural Society of Scotland.*

ON THE METHODS OF EXPRESSING THE ANALYSIS OF A SUPERPHOSPHATE.

When the chemical department of the Highland and Agricultural Society was originally established, superphosphate of lime was a manure almost unknown in Scotland. A few farmers had adopted the system of dissolving bones in acid for their own use, but the product was employed chiefly for experimental purposes, and on a very small scale; and the small quantities of the manufactured article used were brought from England, and principally from Newcastle. Under these circumstances, samples of this manure were rarely sent to the laboratory, and in the few instances in which analyses were required, I adopted the plan which had been used by my predecessor, the late Professor Johnston, not because it was the best, but because it did not at that time appear necessary to make any change. Since then the state of matters has greatly altered,—superphosphate having become one of the staple artificial manures, and having in Scotland reached a consumption which probably exceeds that of guano; and now, on looking back, it is a matter of regret that a more precise and chemically accurate method of *expressing* the results of analysis was not adopted at a time when the change might have been brought about without difficulty. That difficulties must attend any alteration in the established methods of expressing the results of commercial analyses is sufficiently obvious, because, as they are almost exclusively addressed to persons who are unacquainted with the refinements of chemical analysis, they are judged of solely by comparison, and if the usual mode of expression be departed from, it is difficult for any one who is not a chemist to do this in a satisfactory manner. Considerable differences are observable in the form of analyses made by different chemists; but so far as those made in my laboratory are concerned, care has always been taken to preserve the original form, which, though perfectly adapted for giving a proper estimate of the value of the manure, is not the most accurate in a chemical point of view. Circumstances to which it is not necessary to refer in detail, some time back induced me to make a change, which only the fear of producing inconvenience had caused me to defer; and I propose now to explain its nature, so as to avoid any misunderstanding as to the meaning of these analyses.

It is scarcely necessary to observe, that a chemical analysis of the most perfect kind aims at expressing the quantities of all the ingredients of the substance analysed, in exactly those forms of combination in which they naturally exist in it; but the mode in which this is done is not known to the non-chemical reader. Suppose that a substance be found to consist of a mixture of sulphate and nitrate of soda, its analysis of course will state this; and it is popularly supposed that the chemist separates these two compounds directly from one another, and, weighing them, determines at once the quantities of each; but this is very far from being the case. On the contrary he ascertains the quantities of soda, sulphuric and nitric acids separately, and then, by a very simple calculation, founded on the established principles of chemical science, he ascertains the proportions of soda which belong to the two acids, and, adding these to the respective weights, obtains the quantities of each of these compounds. In the case we have supposed, nothing is easier than the application of these principles, but it is different when the substances are more complicated, and contain a considerable number of different elements. If, for instance, the substance were found to contain sulphuric acid, nitric acid, soda, and potash, it would then come to be a question how these substances are arranged, and whether it consisted of nitrate of soda and sulphate of potash, or of nitrate of potash and sulphate of soda. In this case it is impossible to demonstrate with rigid accuracy which of these two views is the truth, and the chemist is found to adopt that which appears to him to be the most probable. Of course, if the analyst is content to set down separately the per-centage of each of the four constituents of the substance, he avoids all dispute; but the further arrangement of the results becomes a matter of opinion, in regard to which differences must be expected; and, in point of fact, it may, and frequently does happen, that two different chemists, analysing one and the same substance, may obtain precisely the same experimental results, and yet express them so differently that the analyses appear totally at variance with one another. A chemist at once distinguishes a real from an apparent discrepancy, and can in any analysis calculate back to the original experimental data, and re-construct it according to his own views, so that the mode of expression is of little consequence to him. All difficulties may be evaded by abandoning the attempt to express the mode of arrangement of the elements of the compound analysed, and simply setting down the results as experiment gives them; and this is a plan largely in use among scientific chemists. But it is not applicable to commercial purposes; for the value of a substance which the analysis is intended to determine, not unfrequently depends, to a very great extent, on the particular forms of combination in which its constituents are found; and even if this were not the case, it would be more convenient to represent some of those substances, not in their separate state, but in that of their familiar commercial products.

In applying these observations to the analysis of a superphosphate, it must be obvious that, if each of its constituents were separately given, the result would be very uninstructive; for all the phosphoric acid would appear under one head by itself, while the value of the manure really depends, not so much on its total quantity, as on the proportion existing in a state in which it is soluble in water; and an analysis which did not give separately the quantities of that acid existing in a soluble and an insoluble state, would be practically useless. These observations apply with equal force to every other commmercial product, and hence chemists have found it advisable to agree upon some plan which shall be at once intelligible, and calculated to express with accuracy the chemical constitution of the substance analyzed.

As far as the analysis of a superphosphate is concerned, two different systems of expressing the results have been in use for a considerable number of years, both of which admit of an equally accurate valuation of the manure; and analyses calculated according to either method are comparable among themselves, provided proper precautions are taken. But while both methods indicate with equal accuracy the value of the manure, that adopted by my predecessor, and used up to about a year since by myself, is less consistent with chemical principles than the other. The conviction that a commercial analysis, even for the sake of convenience, should never be allowed to violate what appears to be the most accurate chemical view, has often made me anxious to adopt the latter method; and, after much consideration, I resolved to make the change, feeling assured that it must be done sooner or later, and that to postpone it was to increase the inconvenience which might be encountered. A year's experience has shown me that the difficulty was much smaller than I had anticipated; and the motives which actuated the change have been appreciated when they have been rightly understood, and the advantages of the method now in use fully recognized.

In order to render intelligible to my readers the nature of the difference, it will be best to place before them the analysis of the same superphosphate, calculated according to what may, for convenience, be called the old and new system, it being understood that both are obtained by calculation from precisely the same analytical results. The analysis is one taken at random from the better varieties of that manure:

ANALYSIS OF SUPERPHOSPHATE.

Old System of Calculation.

Water,	20.33
Organic matter,	11.12
Soluble phosphates,	20.80
Insoluble phosphates,	9.00
Sulphate of lime,	14.64
Sulphuric acid,	10.66
Alkaline salts,	8.50
Sand,	4.95
	100.00
Ammonia,	0.96

New System.

Water,	15.54
Organic matter,	11.12
Biphosphate of lime, equivalent to 20.80, bone phosphate made soluble,	13.34
Insoluble phosphates,	9.00
Sulphate of lime.	37.55
Alkaline salts,	8.50
Sand,	4.95
	100.00
Ammonia.	0.96

In comparing these two statements, which appear at first sight so different, it is important to bear in mind that they represent the same analysis—that is to say, the practical operations are one and the same; the difference being merely a matter of calculation—dependent on the use of a different mode of putting together the experimental results. It is to be observed that five of the items—namely, organic matter, insoluble phosphates, alkaline salts, sand, and ammonia—are the same in both analyses, but that in the latter, the quantity of sulphate of lime is greatly increased, while sulphuric acid has entirely disappeared; and in place of soluble phosphates we have biphosphate of lime, accompanied, however, by a statement of the quantity of bone phosphate to which it corresponds, and which, it may be noticed, is identical with the soluble phosphates in the old system of expression. The chemist, in examining these analyses, is enabled to infer from them that the materials used to make the manure (in this case most probably bones, coprolites, and acids) must, when mixed together, have contained in all 29.8 per cent. of phosphates in the state in which they exist in the bones or other materials employed, of which 9.00 remain in their original insoluble form of combination, and the remaining 20.8 have been rendered soluble by the action of sulphuric acid. This change the sulphuric acid brings about by converting them into a new chemical compound, differing from the original bone earth phosphate in composition, and in its solubility in water; so that it is wrong to write down *soluble phosphates*, as is done in the old system, for they no longer exist in the bones in that state, the name really expressing the quantity of insoluble phosphates destined to be converted into a soluble compound by the action of the acid. This change the acid effects by removing from the insoluble phosphates two-thirds of the lime they contain. Now, the 20.80 per cent. of soluble phosphates consist of

Phosphoric acid,	9.6C
Lime,	11.20
	20.80

But when the sulphuric acid comes in contact with these phosphates, it combines with and removes two-thirds of their lime; consequently

Phosphates,	20.80
Subtract lime (two-thirds of 11.20,)	7.46
Biphosphate of lime,	13.34

and there remains biphosphate of lime, consisting of

Phosphoric acid,	9.60
Lime,	3.74
	13.34

As the value of phosphates depends entirely on the phosphoric acid they contain, and is quite independent of the substance with which it is in combination, of course the value of the soluble part is not affected; and it will be observed that in the new system, where biphosphate of lime appears in the analysis, a statement of the quantity of phosphates in their original insoluble state of bone phosphate from which they have been derived, is also given. The lime which has been separated from the phosphates in the act of rendering them soluble, combines with sulphuric acid, and appears in the analysis as sulphate of lime; and, being added to that already existing in the manure, adds greatly to the proportion of that substance. A difference also exists in the quantity of water, due to the fact that sulphate of lime, in its natural state, contains what chemists call "water of combination;" and as it is a rule in such analyses to state all the constituents, as far as possible, in their ordinary commercial forms, the requisite quantity of water is deducted from that appearing in the old system of analysis, to supply its requirements.

The difference between the two modes of expressing the analysis of a superphosphate, when looked at in a broad point of view, consists in this,—that the old method gives the materials which are used to make it, at the moment of mixture before the chemical change has commenced, but distinguishing under a separate head the quantity of phosphates about to become soluble, and the quantity of sulphuric acid destined to produce that change; while the new system represents matters as they actually exist in the manure when it reaches the farmer. It is scarcely necessary to observe that the latter must be the more correct course, and more consistent with the principles usually adopted by chemists.

In estimating the value of superphosphates stated according to the new method, it is important to bear in mind the distinction between biphospate of lime, and soluble phosphates—the former being worth more than half as much again as the latter. Latterly I have been accustomed to assume £30 per ton as the value of soluble phosphates, and £47 for that of biphosphate of lime, in calculating the values of these manures. Of course those proportions are liable to vary with the state of the market, but they must always bear that ratio to one another.

The analysis of a superphosphate is one of the most troublesome and complicated of those which we are commonly called on to make, and requires a variety of precautions, to insure accuracy, which are little understood by those chemists who have not directed their special attention to it. The method most commonly employed of determining the biphosphate of lime, which consists in adding a quantity of chloride of calcium to the solution in water, is especially fallacious, and causes that substance to be overrated by from one to three per cent., and consequently exaggerating the value of the manure from 9s. to £1, 7s. per ton. The farmer is peculiarly interested in this point, and it is one which necessarily entails considerable difficulty, as nothing appears on the face of the analysis itself to indicate the method in which the phosphates have been determined; and it is the more important, because a certain class of dealers, who cannot be called fraudulent, but who are not unnaturally anxious to make their wares appear to the best advantage, find out those chemists who, by adopting the less accurate mode of experiment, obtain a higher result than others, and prefer their analysis; and it concerns such chemists also, because they may thus lend themselves to an over-estimate of the value of the manure they analyse.

It is much to be desired that some simple rules should be laid down to enable farmers to judge of the accuracy of an analysis, but unfortunately nothing short of a knowledge of chemistry will enable them to do this in all cases.

The necessity which exists for this was brought very prominently under my notice some time since, by an analysis of a superphosphate emanating from a chemist of some popular repute, and stated according to the old method, which gave eighteen per cent. of soluble phosphates, and only *one and a half* of sulphuric acid; while it is well known that this quantity of phosphates can not be made soluble by less than *nine or ten per cent. of acid;* indicating, of course, that the analysis must be erroneous, as actually turned out to be the case on repetition, when only some fourteen per cent. of soluble phosphates were found in it. Unfortunately it is not always so easy to detect errors as it was in this case, and it cannot be doubted that the farmer is often misled by inaccurate and incomplete analyses.

NOTE ON CONCENTRATED CATTLE-FOODS.

I had prepared some month since a short notice regarding the nature of some of the substances now so extensively advertised as foods for cattle, which circumstances prevented appearing at the time it was written. Since then, Mr. Lawes has published in the *Journal of the Royal Agricultural Society of England*, a paper on the same subject, in which he expresses opinions completely concordant with my own, and has rendered my observations unnecessary. But as there are probably many readers of the Transactions into whose hands Mr. Lawes's paper may not fall, it may be of some use to put on record analyses of such foods, merely for the sake of showing how little they merit the encomiums bestowed on them, or the price at which they are advertised.

	I.	II.
Water,	14.38	12.65
Oil,	7.05	4.00
Albuminous compounds,	10.00	7.94
Gum, sugar, &c.,	54.37	69.81
Fibre,	7.61	
Ash,	6.59	5.60
	100.00	100.00
Nitrogen,	1.60	1.27

These substances are made up of a variety of different kinds of ordinary food, among which Indian corn and bean meal appear to be the principal, mixed with a small quantity of some aromatic seed (in one case apparently caraway seed) for the purpose of giving the mixture an attractive flavour. The exact nature of the latter substance cannot be determined without a long and elaborate examination, which, under the circumstances, it did not appear necessary to undertake; for the results, so far as they go, are sufficiently conclusive as to the value of the articles. It is obvious that they are cattle-foods of the most ordinary description, of comparatively low value, and not for a moment to be compared with the ordinary cereals, beans, or oil-cake. And yet No. 2 is offered for sale at £42 per ton, being at the rate of 4½d. per lb., when the meat it is to produce is sold for 6d. The materials of which these foods are made, cannot, when reckoned at the very highest rates, be worth more than from £7 to £10 per ton; so that the farmer who purchases is made to give an unreasonable and unfair price, which he ought not to pay, *even if the food fulfilled* the promises of the sellers. That the traffic in these articles must be carried on very extensively cannot be doubted; and it is a matter of the very greatest regret that farmers should give countenance to it by testimonials, of which a long list is to be found appended to the advertisements. So strong is my opinion on this point, that I have absolutely refused to make analyses of these foods for their makers, lest the results should be used in any way to lead farmers into the belief that I am favourable to them.

It is worthy of notice that all foods of this description have a small quantity of an aromatic substance mixed with them, which may serve the part of a condiment, and induce the animals fed upon them to consume a larger quantity of their ordinary food, and, by promoting digestion, cause the animal to fatten more rapidly than it otherwise would. But on this point we had no information; and it would be of interest to have a few experiments made on the effect of such substances mixed in small proportion with the food of animals. But even supposing a favourable result to be obtained from such substances, it would not in any way invalidate the remarks now made, or form an argument for the farmer's paying £40 per ton for what is worth £7 or £8.

ON SOME NEW VARIETIES OF GUANO.

During the first ten or twelve years after the use of guano became common in this country, the supply equalled, if it did not exceed, the demand, and the farmer had the opportunity of choosing between Peruvian and some other varieties—such as Ichaboe and Saldanha Bay—which, though inferior, were good, servicable guanos, and in some soils gave as good or even a better result than the more expensive kind. The deposits of the latter, which appear not to have been large, were exhausted very rapidly, and their place has since then been very imperfectly supplied; for notwithstanding an active search in all parts of the world, and the discovery of numerous deposits, some of them of very considerable extent, the quality has generally proved very inferior; and as yet, none comparable to Peruvian, and very little which will bear comparison even with Saldanha Bay, has been discovered. The importations of new and inferior guanos have nevertheless been very large, and we shall certainly be very greatly within the mark if, excluding all the better kinds, we estimate the quantity of the inferior guanos which have reached the British Islands within the last five years, at a hundred thousand tons. Much of this is almost absolutely worthless; but, taking a general average, their value, as indicated by many analyses made in my laboratory, does not exceed £3 or £4 per ton. The cost of importing a guano, including expenses at the place of loading, freight, and charges in this country, certainly cannot fall short of £5 or £6 per ton; and when profit to the importer and retailer is added, the cost to the farmer, at the very lowest possible estimate, must exceed £7 per ton. If these calculations be correct—and they are undoubtedly all below the truth—either the importers of guano or the farmers must, during these five years, have incurred a loss of from £300,000 to £400,000. It is a question of considerable interest to determine which of these two parties has been the loser; and it requires but little consideration to see that, though the importers may not have been scatheless, the main bulk of the loss must have fallen on the farmers. It is well known to all persons acquainted with commercial matters, that, though not very saleable, these guanos are eventually got rid of. Some of them are used for adulterating Peruvian guano, but the bulk reaches the farmer directly. Now, it is only necessary for the farmer to ask himself whether he has ever bought a guano at £3 per ton, or seen one in the market at that price, to enable him to draw his own conclusions; and he may rest assured, that if, during the last five years, he has bought a guano at £7 or £8 per ton, without seeing or understanding the analysis, the chances are that he has paid for it nearly double its real value.

The cure of this, no doubt, is in the hands of the farmer himself, if he chooses to make use of it; but there is so much inertness and indifference, that things can only be made right by the discovery of large supplies of guanos of better quality than those recently discovered; and this cannot be done until importers employ persons of skill and experience in the search. At present everything is intrusted to the ship captains, who judge of the quality of the guano by all sorts of rude and insufficient tests. Meanwhile an increased supply of really good guanos of uniform composition, is a matter of the highest moment, and I have always looked upon it as one of my most important duties to watch for, and bring under the notice of agriculturists, guanos likely to prove useful, or which are of manifestly inferior quality.

On the present occasion, I have the satisfaction of directing attention to a new guano, which seems likely to be a very important boon to the farmer. It is met with on a small island in the Pacific, apparently of the coral formation. It has not yet been imported, but samples have arrived which are of a very promising kind. Two, which have been analysed, were found to contain—

	I.	II.
Water	4.60	4.60
Organic matter and ammoniacal salts	16.85	16.38
Phosphates	71.40	69.90
Carbonate of lime	3.15	7.90
Alkaline salts	3.90	1.07
Sand	0.10	0.15
	100.00	100.00
Ammonia	1.32	1.26

These samples are both very dry, and may possibly have lost some moisture during their transport to this country; but, making due allowance for this, it is obvious that this is a very excellent specimen of the phosphatic guano—of a kind which has been little seen of late years. It may be best compared to Saldanha Bay, but is superior to it in the quantity of phosphates, and if of uniform quality, will undoubtedly come largely into use. It is stated that the island contains upwards of 5,000,000 tons of guano, apparently of very uniform quality. The shore is also covered with coral sand, containing a considerable quantity of phosphates, but not sufficient to render its importation profitable. Two samples have been examined for phosphates, which showed the following per-centages:

No. 1	13.65
No. 2	18.07

The remainder of their constituents were not determined, but they consisted chiefly of carbonate of lime. I have not been able to learn whether this guano is likely to be imported in sufficient time for the next turnip crop, but its arrival will be looked forward to with interest.

A very remarkable guano has recently been imported from the west coast of South America, under the name of Valparaiso guano. It consists of a mixture of a powder, with large lumps of an exceedingly hard reddish brown substance, which require a pretty smart blow with a hammer to break them. A fair sample was found to contain:

Water,	7.85
Organic matter and ammoniacal salts,	14.75
Phosphates,	20.07
Sulphate of lime,	5.56
Alkaline salts, consisting principally of common salt,	47.60
Sand,	4.17
	100.00
Ammonia,	2.21
Phosphoric acid in the alkaline salts, equal to 6.42 phosphate of lime,	2.94

The hard lumps, which appeared like stones, were found to have a composition differing but little from the foregoing; they contained:

Water,	5.25
Organic matter and ammoniacal salts,	13.50
Phosphates,	16.30
Sulphate of lime,	3.26
Common salt,	54.26
Other alkaline salts,	4.28
Sand,	3.15
	100.00
Ammonia,	1.77
Phosphoric acid in the alkaline salts,	0.99

These lumps must be looked upon as a mixture of rock salt and guano, and it is impossible to avoid speculating as to how it could be deposited. The lumps were quite as hard as the ordinary rock salt; and it is stated that the deposit is of considerable extent and depth. It is scarcely necessary to observe that it is not likely to prove of much use to the farmer.

Another new guano, bearing some resemblance to Ichaboe, has recently been imported; but from what locality I did not learn. It contains:

Water,	20.31
Organic matter and ammoniacal salts,	36.24
Phosphates,	22.15
Carbonate of lime,	0.43
Alkaline salts,	9.85
Sand,	2.02
	100.00
Ammonia,	6.45
Phosphoric acid in the alkaline salts, equal to 2.24 phosphate of lime,	1.03

The analysis was made after removal of about three per cent. of small pebbles; and this, along with the presence of roots, seemed to show that the deposit was probably a superficial one; or, at all events, that the cargo had been taken from the surface.

At the present time, considerable importations are being made of a mineral phosphate, under the name of Sombrero Island guano, which, though not directly interesting to the farmer, as it will probably not be advantageously applicable to the land in its natural state, is a very valuable material for the manufacture of superphosphate. The greater part of the island of Sombrero is said to be composed of this substance, which forms a bed of some forty feet in thickness. It is found in the form of a soft stone, varying from buff to pinkish in colour. It is easily pulverized, and its powder greatly resembles bath-brick in appearance. A sample examined in the laboratory contained:

Water,	8.96
Phosphate of lime,	37.71
Phosphates of alumina and iron,	44.21
Phosphate of magnesia,	4.20
Sulphate of lime,	0.86
Carbonate of lime,	3.36
Soluble silica,	0.30
Sand,	0.40
	100.00
Total phosphoric acid,	36.36
Equivalent to phosphate of lime,	79.36

Another sample of the same substance contained:

Phosphates,	77.90

A considerable quantity of the phosphoric acid in this substance is in combination with alumina and iron; but this cannot affect its agricultural use. As a material for the manufacture of superphosphate, it is of much value, and, being sold at £5, 10s. per ton, it is materially cheaper than bone-ash, which, if containing 79 of phosphates, would be sold for about £7, 10s. per ton.

It is necessary to guard against confounding the true Sombrero Island guano with another substance sold under the same name, and which contains—

Water,	3.85
Organic matter	11.60
Phosphoric acid,	26.23
Oxide of iron and alumina,	28.76
Lime,	18.12
Carbonate of lime	2.27
Alkaline salts,	6.57
Sand,	2.60
	100.00
Ammonia,	0.22

In this instance the phosphoric acid is equivalent to more than 57.70 of phosphate of lime, and the whole characters of the substance are quite distinct from those of Sombrero guano. It is much darker in colour, and resembles an ordinary guano. From some circumstances which have come to my knowledge, there is reason to suspect that it really comes from Avis Island, which is not far distant from Sombrero Island, and is known to contain a phosphorite similar, but inferior, to that from the latter locality.

NOTE ON A PARTICULAR KIND OF SULPHATE OF AMMONIA.

The sulphate of ammonia hitherto met with in commerce, has been on the whole remarkable for its purity, and has usually, even when dark-coloured, contained about 95 per cent of the salt, and from 24 to 25 per cent of ammonia. Within the last few months, however, a kind has been introduced which looks very well—is pale coloured—sometimes is almost quite white—and well crystallized, but which, nevertheless, is considerably inferior to many samples which are less satisfactory to the eye. It varies considerably in composition, and sometimes contains several per cent of muriate of ammonia. The following are analyses of it:

	I.	II.	III.	IV.
Water,	7.93	9.05	6.20	5.77
Sulphate of ammonia,	71.78	79.63	84.25	85.21
Muriate of ammonia,	7.85	....	....	....
Fixed salts,	12.44	11.17	9.55	9.02
	100.00	99.85	100.00	100.00
Ammonia,	20.98	20.55	21.65	21.94

These samples all contain a considerable quantity, both of water and fixed salts, and are worth from 10 to 15 per cent less than the best sulphate of ammonia. They have apparently been manufactured by some new process, for they all contain a small quantity of sulpho-cyanide of ammonium—a substance possessing the property of striking a dark-red colour with iron salts, and which affords a convenient means of recognising sulphate of ammonia of this kind. It is probably prepared from the so-called ammonia refuse, or ammonia black of the gas works—a substance got in one of the patent processes for purifying gas. This substance contains sulpho-cyanide of ammonium, and a considerable quantity of sulphate of ammonia, and has hitherto been sold at a very low price. I have recently been informed that a process has been contrived for extracting sulphate of ammonia from it, and I suspect that these samples have been so prepared. The farmer ought to be on his guard against this article, which he would, from its appearance, take to be of excellent quality; and should take care to examine the analysis, and to observe that the price charged him corresponds with the per centage of sulphate of ammonia.

COMPOSITION OF TWO KINDS OF MANUFACTURING REFUSE WHICH MAY BE EMPLOYED AS MANURES.

Two kinds of refuse from manufactories have recently come under our notice in the laboratory, both of which may be advantageously employed as manures.

The first is a refuse obtained by Teal's patent for recovering the fat from waste-soap liquors. This process, which is chiefly applicable to wool scourers' soap-waste, is conducted in the following manner:—The fluid, as obtained from the wool-scourers, is run into large tanks, where it is heated along with sulphuric acid, which causes the fat to separate from the soap and rise to the surface, carrying with it all the impurities removed from the wool.

The semi-solid product, after separation from the water, is subjected to pressure in powerful Bramah presses, when the oil or grease is expressed, and a dark brown cake—still containing some oil along with small quantities of woollen fibre and other impurities—is left. This substance constitutes the refuse in question. Its composition is—

Water,	9.16
Organic matter,	70.65
Phosphates,	1 37
Alkaline salts,	2.96
Sand,	15.86
	100.00
Ammonia,	1.15

Calculating according to the principle usually adopted for valuing manures, this substance is worth rather more than £1 per ton. But it must be distinctly understood that this is its value on the farm and not at the place of manufacture, where it ought to be sold at from 10s. to 15s. per ton. The reason for this will be at once apparent, if the cost of carriage be taken into account. If a ton of Peruvian guano cost £13, and the expense of cartage be 5s., then the total cost of that manure on the farm will be £13, 5s. per ton; but to produce the same manurial effect with this refuse, it would be necessary to employ thirteen tons; and if £1 were paid for it, the cost of the whole would then stand thus:

Thirteen tons at £1,	£13	0	0
Carriage, at 5s. per ton,	3	5	0
Total cost,	£16	5	0

Giving a difference of £3, which would have to be deducted from the price of the thirteen tons, to make them equal in cost to guano. If we add that this substance would probably not act so rapidly as guano, we require to make a further deduction, because, all other things being alike, the manure which makes its return most rapidly is the most valuable.

The other substance is glue-makers' refuse, of which the composition is—

Water,	41.05
Organic matter,	35.90
Phosphates,	1.90
Carbonate of lime,	18.81
Sand,	2.34
	100.00
Ammonia,	2.60

The value of this substance is about £1, 16s. per ton, subject, of course, to a certain deduction for the cost of carriage. It has been long employed as a manure in the neighborhood of tan and glue-works, and with marked success. It acts rapidly, being generally in a more or less putrid state, and may be usefully employed on all kinds of crops.

While mentioning these substances, it may be well to refer to an article sold under the name of wool-manure, because that title is calculated to mislead the purchaser. Several samples of the manure in question were analysed in the course of last season, and the subjoined will serve as a specimen of all the others:

Water,	14.92
Organic matter,	12.76
Soluble phosphates,	1.25
Insoluble phosphates,	24.58
Sulphate of lime,	24.47
Sulphuric acid,	traces
Alkaline salts,	3.39
Sand,	18.63
	100.00
Ammonia,	1.36

It is obvious that the name wool-manure by no means describes this substance, which is neither more nor less than an inferior superphosphate. It may have been made from coprolities and the organic matter obtained by mixing it with wool-refuse; but there were no indications by which the accuracy of this opinion could be supported or refuted. The value of the manure does not exceed £3 per ton.

From Jackson's Agriculture and Dairy Husbandry.

Culture of Wheat.

Wheat is the most important of all the grains. The variety most profitable to be produced must depend upon the nature of the soil, as land which has produced an indifferent crop of one may yield an abundant crop of another kind, and land is frequently found to yield better crops if the varieties be alternately changed. It has been observed, that a mixture of grain produces the heaviest crops, and that mixed flour makes the best bread.

The richer description of clays and strong loams are the best adapted for the production of wheat: but if properly cultivated and well manured, any variety of these two soils will produce excellent crops of this grain. Good wheat land ought always to possess a large quantity of clay and little sand; for although light soils may be made to produce good crops, yet the strong clay lands in general yield the heaviest grain. Sandy soils, being deficient in firmness, do not afford sufficient support to the roots of plants, such as wheat, which do not sink far into the soil. There are light soils, however, made from decomposed granite, felspar, or clay-stone, compounded with vegetable matter, which produce excellent wheat. These soils abound in the neighbourhood of Edinburgh, and in Fifeshire, and the wheat from them is frequently superior to any in the Edinburgh market. The produce of these soils, however, is much hurt by dry weather.

"Colonel le Couteur, of Jersey, has made the culture of the best varieties of wheat his particular study for several years, and has arrived at the following conclusion, by actual and careful experiment, namely, 'that one ear of a superior variety, sown grain by grain, and suffered to tiller apart, produced 4 lbs. 4 ounces of wheat, whereas another ear of an inferior sort, treated in the same manner, produced only 1 lb. 10 ounces. This proves that it is of paramount importance to select the most productive and farinaceous sorts for seed; it being obvious that a farmer who would have sown his whole crop with the last variety, would have probably been ruined; whereas, the superior variety would have enabled him to farm with profit.' It is hardly possible to enter a field of wheat nearly ripe, without observing that the ears of some of the plants are much superior to the generality of those growing around. Several new and excellent sorts have been obtained, by intelligent farmers making a selection of these remarkably superior ears; saving and growing them apart until the pure stock was increased to serve themselves, and, in time, their immediate neighbourhood. By such means, the Hardcastle, the hedge-wheat, Hunter's, Heckling's, &c., have been originated, and with manifest advantage to the sower, so long as the sorts were kept pure, and attention being paid to giving the sorts those most suitable soils which experience had pointed out. This mode of obtaining improved varieties of corn, so strenuously advocated by Colonel le Couteur, has been practised but by few farmers—a general idea prevailing among them that it is the richness of the land and judicious culture which gives quality, and consequently value, to the sample. In this they are partly right: because, though very fine wheat, in a miller's estimation, may be grown on poor land, it is impossible to grow a profitable crop—a great bulk of both straw and grain answering the farmer's purpose better than the high quality of the latter. But Colonel le Couteur seems fully convinced that both these objects, that is, quantity and quality, may be obtained at the same time, upon ordinary wheat land; and this is a result that should always be kept in view by agriculturists. Adapting the sort to the soil is one means for securing success. The red and yellow wheats answer better on the heaviest clayey loams than the white varieties, which are delicate, and more suitable for lands of a lighter description."* Sir George Mackenzie of Coul has found by experiment that the variety of wheat, cultivated so successfully by Colonel le Couteur, thrives well in Ross-shire, and in that northern county actually yields a heavier produce than in Jersey. This, however, we must ascribe to Sir George's skilful mode of farming more than to either soil or climate.

The late Mr. Brown, of Markle, an experienced agriculturist, was of opinion that profitable crops of wheat might be produced every second year on rich clays and loams, if well cultivated and situated in a good climate. Land, however, must be highly manured and judiciously fallowed, to bear such frequent repetitions of wheat.

"The season for sowing wheat is necessarily regulated by the state of the land, as well as of the season, on which account it is not always in the farmer's power to choose the moment he would prefer. After fallow, as the season allows, it may be sown from the end of August to the middle of November. On wet clays, it is proper to sow as early as possible, as such soils, when thoroughly drenched with moisture in autumn, are seldom in a proper state for harrowing the succeeding spring. In the opinions of many experienced husbandmen, the best season for sowing wheat, whether on fallow, rag-fallow, or ploughed clover stubble, is from the beginning of September to the 20th of October, but this must depend upon the state of the soil and weather. In East Lothian, on dry, gravelly loams, in good condition, after a clover crop, and well prepared, wheat has been known to succeed best when sown in November. After drilled beans, whenever the season will admit of ploughing and harrowing, wheat may be sown from the middle or end of September to the middle of November; after this season, the sowing of wheat ought not to be hazarded till the spring quarter returns.

After turnips, when the crop is consumed or fed off, and the ground can be properly

* Young Farmer's Manual, by J. Main, 1839.

ploughed, wheat may be sown any time betwixt the 1st of February and the middle of March, and it is customary to plough and sow the land in successive portions as fast as the turnips are consumed. It is only on turnip soil of a good quality, verging towards loam, and in high condition, that winter wheat, sown in spring, can be cultivated with success. When circumstances are favourable, however, it will generally happen that such lands, when wheat is not too often repeated, will nearly produce as many bushels of wheat as of barley. The wheat crops, therefore, on an average of seasons, will exceed the value of the barley crop considerably; hence its culture is an object which ought not to be neglected."*

Wheat, as will afterwards be more particularly mentioned, is liable to certain diseases, as, for example, smut, mildew or rust, &c. With the view of preserving the grain from these most injurious disorders, it is customary to prepare the seed by steeping or pickling it in a kind of saline brine, or diluted urine. The value of this process may be learned from the following experiments, as stated in various reports before us. Mr. Bailey, of Chellingham, tried experiments on seed in which were a few balls of smut. One-third of the seed was steeped in urine, and limed; one-third steeped in urine, dried, and not limed; and the other third sown without steeping or liming. The result was, that the seed which had been pickled and limed, and that which was pickled and not limed, was almost free of smut, while that which was sown without undergoing this process was much diseased. The following experiments were made at Lord Chesterfield's farm of Bradly-Hall, in Derbyshire: The first was on a peck of very smutty wheat, one-half which was sown in the state it was bought, and the other washed in three waters, steeped two hours in brine strong enough to float an egg, and then limed. The result was, that two-thirds of the wheat grown from the unwashed seed was smutty, while that produced by the steeped and limed seed had not a single ear of smut. The second experiment was made upon some very fine wheat, perfectly free from smut. A quart of this was washed in three waters, to make it perfectly clean; it was then put for two days into a bag in which was some black dust of smutty grain, and the result was, that a large portion of wheat thus sown was smutty, while out of twenty acres sown with the same grain, not inoculated, not one smutty ear was found. Mr. Taylor, junior, of Ditchingham, near Bungary, rubbed a number of ears of wheat with the powder of smut, having moistened them to make the powder adhere; one-half of these were washed, wetted with chamber lye, and limed. A similar quantity of dry wheat was then procured, the whole being dibbled, each parcel by itself. The produce of the infected wheat was three-fourths smut; the same infected wheat, steeped and limed, was perfectly sound. The valuable results arising from steeping wheat seed need not be further illustrated, and we shall now proceed to describe the process.

Steeping or pickling is performed, as already mentioned, after the seed has been washed, by allowing it to lie for a time amongst stale urine, diluted with water, or salt brine, of sufficient strength to float an egg. The seed is put into tubs, containing as much liquid as will cover the grain a few inches, and allow it to be well stirred, so as to bring all the light grains to the surface, which are skimmed off as long as they continue to rise. Another way is to put the seed into baskets, which are immersed in the water, are easily taken out, and can be conveniently placed over an empty tub to drain. The seed is left for three or four hours in the chamber lye, or full six hours in the pickle, after which the liquor is drawn off, and the wheat spread thinly on the floor of the granary, where it is well sprinkled over with quick-lime slaked in the liquid. About half a peck of lime is sufficient for a bushel of wheat, and it should be well stirred, so that every grain may get a portion. If the seed is to be drilled, it should be passed through a coarse sieve after being limed, which will facilitate its progress through the machine. The grain will thus be quickly dried; and it should not lie more than six hours in the heap, then be spread out and used the following day.

Some caution should be used in having the lime properly slaked, for if this is not done, too great a heat may be raised, which will destroy the vegetative principle. Doubts have been expressed of the efficacy of lime, and a solution of copperas is used on the Continent instead. Dry powdered lime would certainly have no effect, but when

* General Report of Scotland.

newly slaked it is very efficacious, as has been proved from experiment. It was found that a steep of lime-water alone, in which wheat was immersed for four and twenty hours, proved a powerful preventive of disease, while the good effects of unmixed urine were very inconsiderable.

Of the two kinds of steep mentioned, urine is thought the most efficient, and it should be used neither too fresh nor too stale, as in the first state it is ineffectual, and in the second, injurious. The seed should be sown as soon as dry, for if allowed to lie in sacks or heaps beyond a day or two, the lime may be very hurtful. Another steep, which is recommended by Sir John Sinclair, and is much used in Flanders, France, and Switzerland, is a weak solution of the sulphate of copper, or blue vitriol. The modes of using it are as follow:

Into eight quarts of boiling water put one pound of blue vitriol, and while quite hot, three bushels of wheat are wetted with five quarts of the liquid; in three hours the remaining three quarts are added, and the wheat is suffered to remain three hours longer in the solution. The whole should be stirred three or four times during the six hours, and the light grains skimmed off. After the wheat is drained, slaked lime is thrown on it to facilitate the drying. Another way of using it is, to dissolve five pounds of the sulphate of copper in hot water, and add as much cold water to this as will cover three bushels of wheat. The wheat is allowed to remain five or six hours, or even longer, in the liquid. After two or three bags, of three bushels each, have passed through the liquid, one pound more of the sulphate for each bag should be added: and after twelve bags or so have passed through, new liquid will be required.

Various other preparations of vitriol, nitre, sulphur and arsenic have been tried, in some instances with considerable benefit; and a solution of one pound of arsenic, in thirty gallons of water, has been recommended as a destructive of insects and field mice. From what has been stated, the importance of this operation will be at once apparent, and its practice ought never to be neglected. "But unless other means be taken to guard against the infection, the farmer can never be secure against the communication of the contagion, even after all these operations have been performed. The contagious smut powder adheres to sacks and barns with which it has been in contact; it attaches itself to the straw and chaff, and is thus probably in many instances carried from the barn and stable doors, when the dung is taken green to the fields, without being properly turned and fermented. The infection may indeed be carried by the wind from other fields, and in various ways, which cannot be guarded against. But no person, who is duly sensible that the disease may be checked, if not wholly eradicated, by careful attention, should hesitate to employ all those means of prevention which may be in his power The barn in which corn has been either stored or thrashed, should therefore be thoroughly aired, and every corner swept; if also the walls of the interior were well washed with strong lime-water, the precaution would not be improper, and sacks which have held the infected grain should be immersed in a similar solution."*

If the seed is not put in the ground until the spring months, the kind sown should either be of the true spring sort, or taken from wheat known to have been sown in the spring of the preceding year. Wheat is generally sown broadcast, but it is now becoming common to sow it with a machine. By this it is sown in a breadth of eighteen feet, as fast as a horse can walk, being about four acres an hour. The machine holds as much seed at a time as will go over an acre, and requires one man and one woman to manage it, eight horses following to harrow in the seed.

Drilling is much practised on soils of a light character, especially if the land be infested with annual weeds. When sown in spring, the drill allows the free operation of hand-hoeing and weeding, which are of considerable advantage. It occupies more time than broad-cast sowing, and is principally practised on light soils. A third process of sowing is by what is termed ribbing, formerly explained. The seed, in practising this method, is scattered by the hand, and falling for the most part in the furrows between the ribs, it has all the appearance of having been drilled, the ribs being then harrowed across. This process and drilling have the double advantage of allowing the operation of weeding, and also the free circulation of air between the plants, which is of great importance when the grain is ripen-

* British Husbandry.

ing. Dibbling in the seed is a process practised in some parts of Norfolk, but it requires too much labour ever to become general. It is performed by one man dibbling, and three or more children dropping in the grains; and the seed is harrowed in by a bush harrow. It saves seed greatly; and the grain produced is more equal throughout a field than by the broadcast method.

"The quantity of seed necessary depends both on the time of sowing and the state of the land—land sown early requiring less than the same land when sown in winter or spring, and poor land being always allowed more seed than rich. The quantity accordingly varies from two bushels or less to three, and sometimes even to four bushels per imperial acre. Winter wheat, when sown in spring, ought always to have a liberal allowance, as the plants have not time to tiller much without unduly retarding their maturation."*

The depth at which the seed is deposited in the soil is not of material consequence; but it should always be sufficiently covered to protect it from the depredations of birds. This is proved by the vigorous growth of shaken wheat and all other grains, although not all covered by the soil.

When broad-cast sowing is practised, harrowing, rolling and hand-hoeing will be the principal after-culture necessary. These operations are useful to loosen the ground when grass seeds are sown in winter wheat, and at the proper season are beneficial to the wheat itself. On strong clay soils they are sometimes performed even when grass is not sown, especially if the winter has been wet, or the crop appear thin. The operation should be done when the crop begins to vegetate; and great attention is necessary to this, as, if the plants are in an inactive state, they may be rotted by the work, and if too far advanced, their growth may be checked.

"Rolling in spring ought never to be omitted on dry porous soils, which are frequently left in so loose a state by the winter frosts, that the roots quit the soil and perish. If the land be rough and cloddy, the roller has a still more beneficial effect than the harrow in pulverizing the inert masses and extending the pasture of the plants. Hand-weeding, so far as to cut down thistles and

* Encyclopædia Britannica, article Agriculture.

other long weeds, is never neglected by careful farmers, but the previous culture ought to leave as little as possible of this work to be done when the crop is growing. Annual weeds, which are the most troublesome, can only be effectually destroyed by hand-hoeing; and to admit of this, the crop ought to be made to rise in rows, by being sown either by a drill machine or on ribs. Where grass seeds are to be sown on drilled wheat, the hand-hoeing assists in covering them."*

Feeding sheep on young wheat is sometimes practised in England, when the shoots are too luxuriant in the early part of spring, in order to check the growth of the outer blades. The practice, however, is objected to, as the sheep will generally prefer the tender blade in the heart of the plant, which may hurt its after-growth. In Scotland this is seldom or never practised, as the consequences are thought too dangerous in a cold, uncertain climate.

The almost universal practice is to cut wheat before it is dead ripe, as at this stage the grain is apt to drop from the ear, and the ear itself to break off, which causes considerable loss of grain. The best time for cutting this and all other grains is when no juice can be expressed from the straw immediately below the ear; the grain will then be comparatively clean-skinned and fine, and both grain and straw more valuable than if allowed to get too ripe. When too ripe, the grain assumes a dusky color, which is much against its appearance.

"The flour of wheat which is cut before it is quite ripe, is whiter than that which is allowed to come to maturity, and bears a higher price in the markets. The grain which is intended for the miller should therefore be reaped before it has reached its perfect growth. The wheat is ground into meal of various degrees of fineness, and a bushel of 60 lbs. weight generally yields, when dressed, about the following quantities:—Fine flour, 25½ lbs.; household flour, 22½ lbs.; pollards, (shorts,) 8 lbs.; bran, 3 lbs. A bushel of wheat, therefore, averages 48 lbs. of both kinds of flour of that sort called *seconds*, which is alone used for making bread through the greater part of England; and a sack of marketable flour must by law weigh 280 lbs. The bakers admit they can make two or three quartern loaves

* Encyclopædia Britannica, article Agriculture.

more than the usual quantity from one sack of flour when it is the genuine produce of good wheat. It was found, upon a comparative trial of English and Scotch wheat, of apparently equal quality, that there was a difference in favour of the English of no less than 13 lbs. of bread upon 2½ cwts. (280 lbs.) of flour. As to the greater quantity of bread produced by an equal weight of English flour, the cause appears to be, that the English flour is more absorbent than the Scotch, and consequently requires more water to bring the dough to the same consistency for being baked."*

Wheat is almost universally cut with the sickle, (lately with the reaping machine,) and tied up in sheaves, which are often made of single lengths of the straw, and the smaller the sheaves the easier they are dried. The sheaves are set up in stooks of twelve or fourteen, according to the length of the straw, and are set in rows, the top of each touching, with an opening at the bottom to admit the free passage of the wind. From the strength of the straw, wheat remains opener in the sheaves than any other grain, and consequently wins and dries sooner. The best criterion for judging of the fitness of grain to be carried home is to examine the knots or joints of the straw, and if these be perfectly dead and free from juice, the crop may be then gathered with safety, even although it be a little wet with rain. If the crop, or part of it, is meant to be thrashed early, for seed or other purpose, it is necessary to allow it to remain longer on the field. When the straw is mixed with succulent weeds, or rank clover and grass, the grain must remain on the field till these are dried, or, from their wet nature, the crop will be apt to heat in the rick, and the produce be injured.

Ashes as a Manure.

Facts in agriculture, though of seeming insignificance, are always interesting and valuable. It may scarcely seem necessary to urge upon farmers the value of wood ashes as a manure, or the advantages of their application to the soil, as both leached and unleached ashes, within the last few years, have become better appreciated for their fertilizing properties—yet it is the province of the agricultural press to give "line upon line, and precept upon precept," to bring forth "thoughts new and old" for the reasonable consideration of its readers.

Ashes may be used with advantage to almost any class of crops, but especially as a dressing for grass, grain and Indian corn, though the immediate benefit of ashes is most perceptible on leguminous plants, such as clover, peas, beans, &c. Ashes, in some respects, act like lime; consequently on thin, poor soils, they should not be applied in large quantities, unless vegetable matter is added at the same time, as the effect is too stimulating and exhausting. They act like lime in having a tendency to give compactness to light sandy soils, and render heavy clay soils light and friable. They serve, too, to neutralize whatever superabundance of acids there may be in any soil.

As a top-dressing to grass, ashes are very beneficial, as it roots out the moss, and promotes the growth of white clover. Mossy meadows and pastures may be renovated by applying ashes and plaster (gypsum). There are always natural grass seeds in every soil, lying ready for germination and growth as soon as the manurial or feeding elements of the soil are ready for their development. On this principle it is, that a dressing of lime, or ashes and plaster, will bring into action seeds of white clover, where a white clover plant was never known to have existed before.

As an application to the corn crop, ashes have been found to be of much value—applied as a hill dressing about the time of the first hoeing—enabling it to get a better start in the early part of the season, and thus preparing it better to withstand the drouth of mid-summer. They not only cause the plants to start vigorously, but enable them to hold that vigor until the roots attain size and strength to seek, over a larger proportion of the soil, the elements needed. We have noticed a material difference in the yield of corn-fields, dressed and undressed, which could only be attributed to this fact. Some farmers practice mixing salt with ashes as a top-dressing for corn, but whether beneficial or not we cannot say from experience; but the better way, we should think, would be to use the salt in the compost-heap, where, in small quantities, it might prove beneficial in promoting the decomposition of animal and vegetable substances.

It has been asserted that ashes at twenty-five cents a bushel are cheaper than phos-

* British Husbandry.

phate of lime at six cents per pound. Several salts are necessary for full growth and maturity of the wheat plant. In using the super-phosphate of lime, the farmer uses but one of the salts necessary for its perfection; but in the use of ashes, he applies, besides the several salts of potash, more or less of other salts, no less valuable, according to the kind of timber from which the ashes were produced. Different woods have a very different proportion of mineral constituents—hence the value as manure is variable.

Leached ashes produce nearly the same effect with unleached, but a larger quantity is generally required. There are soils in which much alkali exists; in such the soluble parts of ashes will be of little value; and the leached remains may be altogether superior, for few soils contain so much phosphoric acid as not to be improved by its addition as manure. They are of too valuable a character to be suffered to remain unemployed as they have been—remaining in large heaps on the sites of old asheries in many places in the country. We have not the least doubt that every farmer will find it more profitable to apply the ashes made on his premises to the soil, than to sell them to manufacturers at fifteen or even twenty cents per bushel. Farmers are beginning to feel more and more that they must do something to enrich their farms. Let not this source of fertility be neglected, and let further experiments be made in its use.

Rural American.

Advice about Teeth.

An eminent surgeon-dentist, residing in London, gives the following useful hints about the care of teeth. They are simple, timely, and deserve attention:

In the first place, the teeth should be fairly used. By this I mean, not made to perform the duties of crackers for nuts, experimented on to ascertain their strength, or, by ladies, to rival scissors in cutting thread; for, rest assured, in every case, more particularly the last, the party having recourse to such practices, will surely some day rue them; the teeth, so unwittingly injured, being always to part company with their fellows. Those who indulge in such or similar habits, may truly be called the dent'st's friends. Cleanliness is absolutely essential for the preservation of the teeth, and they should be well brushed at least morning and evening, that any feculence which may be attached to them, either during sleep from the stomach, or by day from meals, may not be allowed permanently to adhere, causing, firstly, discoloration, then tartar, and subsequently, if I may so express myself, undermining the constitution of one or more, as from their position they may be more or less liable to corrosion. In order that the teeth should look natural, that is, retain their natural color, a dentifrice, free from the smallest particle of acid, should be used at the matin hour, and the mouth rinsed with tepid water, for extremes of heat and cold are most highly prejudicial not only to their color, but also to their durability; and I know no method so simple of converting a really useful and ornamental set into one of pain and subsequent extinction, than the use of washing in either one or the other. The person who habituates himself or herself, to any extent, to hot soup, tea, or other drinks, assuredly rivals the friend to the dentist just named. Brushes for the teeth should be of medium substance of bristle, and those made on what is called the penetrating principle are best. I would also observe that children at any early age, should be instructed in the use of a tooth-brush, and taught the value and importance of the teeth, in order to inculcate habits of cleanliness, and a due appreciation of the ornaments of the mouth. A brush properly selected (not too hard) may be used by children of five years of age, every morning; and by being part and parcel of the general ablution, and thus directing habitual attention to the teeth, a useful and cleanly habit will be engendered, which will probably insure for them proper care through life.

Industry.

Toil is the price of sleep and appetite, of health and enjoyment. The very necessity which overcomes our natural sloth, is a blessing. The world does not contain a brier or thorn that divine mercy could have spared. We are happier with the sterility which we can overcome by industry, than we could be with the most spontaneous and unbounded profusion. The body and the mind are improved by the toil that fatigues them; that toil is a thousand times rewarded by the pleasure it bestows. Its enjoyments are peculiar; no wealth can touch them.

Measure of Manhood.

No impression of society is more false or fatal to true manhood, than that which measures a man's worth by the field of labor he occupies, so long as that labor is useful and honest—and no dishonest toil can be useful. The nobility of man in this country does not depend on wealth, birth or title. Nor does it take color from the *nature* of his profession, but rather from the *spirit* which animates him—the spirit by which, with or against the smiles of temporal fortune, he shapes his career among his fellow-men. He is a truer man who turns chimney-sweeping to an honest, independent account, than he who, scorning the rough toils of the humble and needy, is willing to live an idler—however proudly caparisoned—upon the industry of others.

Now and then we hear of "the most respectable classes," and find on examination that this respectability is credited to peculiar professions and labors. What could be more offensive to that spirit of republicanism which discards the theory of "divine rights," and special nobilities of blood and caste? Yet this sentiment of distinction exists and increases amongst us. We see it in manifold displays of a pseudo-aristocracy, who, glorying in the possession of superior wealth, won, most likely, by the hard-handed industry and prudence of a former generation, or by some successful speculation, look down with vulgar scorn upon men who eclipse them in all the attributes of manhood. That man is base, who fails to remember with pride a noble-minded or noble-acting ancestry, but baser is he who seeks to hide his own meanness or weakness under the mantle of reputable forefathers. The proudest coat of arms ever graven on a man's shield, or fitted to his shoulders, is the homespun coat won by honest toil. Substract from the world's history the record of such toil, and the earth is stripped of its most substantial glories. The patent nobilities have done little more than to rust and corrupt the fruits of heroic labor.

What matters it whether one carry the hod or the plumb-line—whether one mixes the mortar or handles the trowel—so long as each is essential to human welfare? Not that we would have any man seek a lower grade of toil, if a higher be at his command. What we hold is, that the shepherd and plowman are as noble in their place as is the Secretary of State in his. To the working-man—and he who toils not usefully is a drone among men, and an abomination in the sight of God—we have but a few words of advice. Heed not the false sentiment that would deny you dignity or respectability, because your labor soils your hands and swarths your brow. Better have soiled hands and swarth brow, than the corrupt heart and vicious brain of the two extremes of society who prey on your labor—the vagabonds of the gutter, shameless in their mendicity and crime, and the vaunted aristocracy, whose wealth hides their corruption from the public sight. Aim high with honest purpose, holding a true soul better than gold, and the approval of conscience sweeter than the world's flattery, and you will triumph even in the humblest vocation. Your daily labor shall not be the gauge of your manhood, for you will have over and above that, for self-communion and for society, a heart and brain which are not tied to, nor bound up in, the toil of your hands.

[*Southern Chronicle.*

Fever and Ague.

There are some situations where fever and ague prevails every season, and this is the case in the vicinity of creeks and swamps in Long Island, not one mile from New York City. An acquaintance of ours, who has resided for several years on one of these creeks, never has had a single case of fever and ague in his family, while all his neighbors have been more or less affected with it every season. He attributes his immunity from this troublesome disease to the use of a good fire in his house every chilly and damp night in Summer and Fall. When the Indians travel at night or early in the morning in swampy regions, they cover their nose and mouth with some part of their garments to warm the air which they inhale, and this they say prevents chills and fevers.—*Scientific American.*

The grape crop around Cincinnati is said to be the largest ever grown and is estimated as worth one million of dollars.

Contentment produces, in some measure, all those effects which the Alchemist usually ascribes to what he calls the Philosopher's Stone; and if it does not bring Riches, it does the same thing by banishing the desire for them.—*Addison.*

SEVENTH ANNUAL EXHIBITION

OF THE

VA. STATE AGRICULTURAL SOCIETY,

TO BE

HELD AT PETERSBURG

ON THE

1st, 2d, 3d and 4th of November, 1859.

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SCHEDULE OF PREMIUMS.

BRANCH I.

Premiums for Experiments.

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Class 1st.

1 to 5. For each of five best experiments on any important and doubtful or disputed question or questions of practical Agriculture; each experiment covering not less than four acres of land and including a series of not less than eight different matters of trial, observation, measurement, correct estimate, or comparison of results; and, which moreover, by its proper direction, accuracy of performance, and the careful and full report of procedure and results thereof, shall serve to furnish valuable instruction for practice on the subject investigated, whether two or more experiments shall be on the same subject, or each, on a different one, a premium of $100

Class 2d.

6 to 15. For each of ten other next best experiments, of similar character and merit with the above described, but falling short of the full requisitions for the foregoing, a premium of 25

Class 3rd.

16 to 35. For each of twenty other accurate and instructive experiments, or series of experiments on one general subject, of merit and useful value, a premium of 10

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Remarks and Special Rules for Branch I.

The superiority of merit or value of any two experiments, claiming the same or like premiums, will be decided in reference to the nearest approximation to the following conditions:

1st. The comparative extent and completeness of the processes of experiment, and the apparent accuracy of the procedure.

2nd. The clearness of the report.

3rd. The utility of the information so conveyed.

Exact measurements of results always will add much value to reports of experiments, and should not be omitted whenever the case may require such exactness. But in many other cases, estimates of comparative results, or products, by the eye, may serve, if sufficient for the case and for reaching correct conclusions.

Judges.

The Executive Committee.*

BRANCH II.

Premiums for Written Communications.

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Class 1st.

36 to 40. For each of the five best essays or written communications, whether on the same or on different subjects of practical agriculture, or on scientific agriculture, strictly and usefully applicable to practice, of high order of merit and utility for instruction—and conforming to the requisitions of the general rules on the subject, a premium of $50

Class 2nd.

41 to 50. For each of ten other and next best essays or written communications as above described, but which may fall short of the requisitions for the higher offers, a premium of 20

Class 3rd.

51 to 70. For each of twenty other next best instructive written communications of new facts in agriculture, a premium of 10

71. For the best treatise on gar-

* See Rules and Regulations.

dening suited to the climate of Virginia, to be not less than one hundred pages, 25

72. Best treatise on the culture and management of Broom Corn, 10

Remarks on, and Special Rules for, Branch II.

ESSAYS AND OTHER WRITTEN COMMUNICATIONS.

1. Essays and other written articles on practical subjects, must be founded mainly, and on scientific subjects, at least partly, on the writer's practical experience and personal observation or investigation; though portions of each may rest on other authorities, to be stated particularly or generally, as required by the case.

2. The award of superiority to any one writing over others on the same subject, will be made in reference to its probable greater utility to agricultural improvement or profit, as well as the ability with which the subject is treated.

3. In matter designed to instruct or to guide practical labours, clearness and fullness of details will be deemed a high claim to merit—and next conciseness. Nothing necessary for instruction should be omitted, and nothing included that can be omitted without injury to the value of the instruction.

4. Written Communications to the Executive Committee may be sent in at any time—the earlier the better—as they will at once be referred to the Committee on Essays, who will thus be enabled to scrutinize, and the more correctly to estimate by comparison, the relative merits of the different Essays submitted for their examination.

5. It is required that all written communications to the Society, received at any previous time and published by order of the Executive Committee, and which have not been duly considered, and denied premiums by the judges, shall be still held and considered as claiming, and in competition with any more recent writings for premiums offered, and for which any such writings may be suitable, and further, even the previously published writings, which had been duly considered by the judges at the preceding Fair, and to which premiums were denied, shall still be held under review and consideration, by the judges for the next year's premiums, not again to be placed in competition, but for the purpose of being compared as to degrees of merit with the later writing then under consideration and adjudication for premiums.

6. When a premium has been awarded at a previous time to an essay, any other and later essay or written communication on that subject, to obtain a premium must be either deemed to have important additional value compared with the former one so honoured, or otherwise be very different in matter, or manner of treatment, as well as of a sufficiently high order of merit.

7. All written communications to which may be awarded premiums, will be published in the Transactions of the Society; and any others offered to compete for premiums, and not obtaining that honour, will be published in like manner, if deemed worthy by the Executive Committee.

Judges.

The Executive Committee.

BRANCH III.

HORSES.

Thorough Bred—1st Class.

☞ Awards to be made without regard to performance on the turf, and the judges are required to reject any animal competing in this division, with which there is not furnished a complete pedigree, showing the purity of blood on the side of both dam and sire.

73. For the best thorough bred stallion,	$50 00
74. For the second best,	25 00
75. For the third best,	CERTIFICATE OF MERIT.
76. For the best thorough bred brood mare,	25 00
77. For the second best,	12 50
78. For the third best,	CERTIFICATE OF MERIT.
79. For the best entire colt foaled since 1st January, 1856,	15 00
80. For the best entire colt foaled since 1st January, 1857,	10 00
81. For the best entire colt foaled since 1st January, 1858,	7 50
82. For the best filly foaled since 1st January, 1856,	15 00
83. For the best filly foaled since 1st January, 1857,	10 00

84. For the best filly foaled since 1st January, 1858, 7 50

85. For the best foal dropped since 1st January, 1859, 5 00

☞ No premium to be given in the foregoing class to an animal that is unsound.

Judges.

Col. Wm. Townes, Mecklenburg.
Thomas W. Doswell, Hanover.
William Berkeley, Loudoun.
John M. Botts, Henrico.
Oden Bowie, Marlborough, Md.
Otway P. Hare, Prince George.

The Horse of General Utility—2d Class.

86. For the best stallion for useful and elegant purposes combined, 50 00

87. For the second best, 25 00

88. For the third best, CERTIFICATE OF MERIT.

89. For the best brood mare for useful and elegant purposes combined, 25 00

90. For the second best, 12 50

91. For the third best, CERTIFICATE OF MERIT.

92. For the best entire colt foaled since 1st January 1856. 15 00

93. For the best entire colt foaled since 1st January 1857, 10 00

94. For the best entire colt foaled since 1st January 1858, 7 50

95. For the best filly foaled since 1st January 1856. 15 00

96. For the best filly foaled since 1st January 1857. 10 00

97. For the best filly foaled since 1st January 1858. 7 50

98. For the best foal dropped since 1st January, 1859. 5 00

99. For the best pair of matched horses, 25 00

100. For the second best pair of matched horses, 10 00

101. For the best single harness horse, mare or gelding, 15 00

102. For the second best, 10 00

☞ No premium to be given in the foregoing class to an animal that is unsound.

Judges.

John A. Selden, Charles City,
Norborne Berkeley, (Aldie) Loudoun.
Nathaniel Burwell (Millwood) Clarke.
Dr. Lucian B. Price, Hanover.
Benjamin Wood, Albemarle.

Quick Draught Horses—3d Class.

103. For the best stallion for quick draught $50 00

104. For the second best, 25 00

105. For the third best, CERTIFICATE OF MERIT.

106. For the best brood mare for quick draught, 25 00

107. For the second best, 12 50

108. For the third best, CERTIFICATE OF MERIT.

109. For the best entire colt foaled since 1st January 1856, 15 00

110. For the best entire colt foaled since 1st January 1857, 10 00

111. For the best entire colt foaled since 1st January 1858, 7 50

112. For the best filly foaled since 1st January 1856, 15 00

113. For the best filly foaled since 1st January 1857, 10 00

114. For the best filly foaled since 1st January 1858, 7 50

115. For the best foal dropped since 1st January 1859. 5 00

116. For the best pair of matched horses for quick draught, 25 00

117. For the second best, 10 00

118. For the best single harness horse, mare, or gelding, 15 00

119. For the second best, 10 00

☞ No premium to be given in the foregoing class to an animal that is unsound.

Judges.

Samuel B. Finley, Augusta.
Rob't D. Turnbull, (Lawrenceville) Brunswick.
William T. Joynes, Petersburg.
Thomas Branch, "
Albert Aikin, Henrico,

Heavy Draught Horses—4th Class.

120. For the best stallion for heavy draught, 50 00

121. For the second best, 25 00

122. For the third best, CERTIFICATE OF MERIT.

123. For the best brood mare for heavy draught, 25 00

124. For the second best, 12 50

125. For the third best, CERTIFICATE OF MERIT.

126. For the best entire colt foaled since 1st January 1856, 15 00

127. For the best entire colt foaled since 1st January 1857, $10 00
128. For the best entire colt foaled since 1st January 1858, 7 50
129. For the best filly foaled since 1st January 1856. 15 00
130. For the best filly foaled since 1st January 1857, 10 00
131. For the best filly foaled since 1st January 1858, 7 50
132. For the best foal dropped since 1st January 1859. 5 00
133. For the best pair of heavy draught horses, 20 00
134. For the best team of heavy draught horses, not less than four, 30 00
[To be tested on the Fair Grounds according to such plan as may be prescribed by the judges.]

☞ No premium to be given in the foregoing class to an animal that is unsound.

Judges.

John Harrison, Upperville.
Col. Christopher Haskins, Lochleven.
Francis B. Whiting, Jr., (Millwood) Clark.
George W. Mowry, Augusta.
Sylvanus Johnson, Petersburg.

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Saddle Horses—5th Class.

135. For the best stallion for the saddle, 50 00
136. For the second best, 25 00
137. For the third best, CERTIFICATE OF MERIT.
138. For the best brood mare for the saddle. 25 00
139. For the second best, 12 50
140. For the third best, CERTIFICATE OF MERIT.
141. For the best entire colt foaled since 1st January 1856. 15 00
142. For the best entire colt foaled 1st January 1857, 10 00
143. For the best entire colt foaled since 1st January 1858, 7 50
144. For the best filly foaled since 1st January 1856, 15 00
145. For the best filly foaled since 1st January 1857, 10 00
146. For the best filly foaled since 1st January 1858. 7 50
147. For the best foal dropped since 1st January 1859, 5 00
148. For the best saddle horse, mare or gelding, $20 00
149. For the second best saddle horse, mare or gelding, 10 00
150. For the best pony, 5 00

☞ No premium to be given in the foregoing class to an animal that is unsound.

Judges.

Robert Carter, Upperville.
Peyton R. Berkeley, Prince Edward C. H.
D. W. Haxall, Charles City.
Archie C. Randolph, (Millwood) Clarke.
Dr. Henry Lewis, Brunswick.

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MULES AND JACKS.

6th Class.

151. For the best jack, 50 00
152. For the second best, 25 00
153. For the best jennet, 25 00
154. For the second best, 10 00
155. For the best pair of mules, to be owned and worked one year preceding their exhibition, 15 00
156. For the best team of mules, 4, or more, to be owned and worked 1 year preceding their exhibition, 25 00
157. For the best mule colt, 3 years old, foaled in Virginia, 10 00
158. For the best mule colt, 2 years old, foaled in Virginia, 10 00
159. For the best mule colt, 1 year old, foaled in Virginia, 7 50
160. For the best mule colt, a suckling, foaled in Virginia, 5 00

Judges.

Augustus H. Drewy, Chesterfield.
Sam'l McGehee, Charlotte.
Sharpe Carter, Nottoway.
Robert Blackwell, Lunenburg.
Dan'l Hatton, Nansemond.

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CATTLE.

Short Horns or Durhams, or Herefords, of Native Stock—1st Class.

161. For the best bull, 3 years old and upwards, 50 00
162. For the second best, 25 00
163. For the third best, CERTIFICATE OF MERIT.
164. For the best cow, 3 years old and upwards, 50 00
165. For the second best, 25 00
166. For the third best, CERTIFICATE OF MERIT.

167. For the best bull between 2 and 3 years old, $40 00
168. For the second best, 20 00
169. For the third best, CERTIFICATE OF MERIT.
170. For the best bull between 1 and 2 years old, 25 00
171. For the second best, 12 50
172. For the best heifer between 2 and 3 years old, 25 00
173. For the second best, 12 50
174. For the best heifer between 1 and 2 years old, 25 00
175. For the second best, 12 50
176. For the best calf or heifer 1 year old, 10 00

For the best *Imported Short Horns* and *Herefords*, same premiums as the above, but the *Imported* breeds shall compete only in their own class.

Judges.

A. S. Mathews, Wythe,
John A. Carter, Upperville.
Thomas L. Farish, Albemarle.
Josiah W. Ware, (Berryville) Clarke.
Robert W. Bragg (Rehoboth) Lunenburg.

Devons, of Native Stock—2d Class.

177. For the best bull, 3 years old and upwards, 50 00
178. For the second best, 25 00
179. For the third best, CERTIFICATE OF MERIT.
180. For the best cow, 3 years old and upwards, 50 00
181. For the second best, 25 00
182. For the third best, CERTIFICATE OF MERIT.
183. For the best bull, between 2 and 3 years old, 40 00
184. For the second best, 20 00
185. For the third best, CERTIFICATE OF MERIT.
186. For the best bull, between 1 and 2 years old, 25 00
187. For the second best, 12 50
188. For the best heifer, between 2 and 3 years old, 25 00
189. For the second best, 12 50
190. For the best heifer, between 1 and 2 years old, 25 00
191. For the second best, 12 50
192. For the best calf or heifer under 1 year old. 10 00

Best *Imported Devons*, same premiums as the above, but the *Imported* breeds shall compete only in their own class.

Judges.

Dr. Philip B. Pendleton, Louisa.
H. K. Burgwynn, Halifax, N. C.
Paschal Buford, Bedford.
Harrison Brander, Chesterfield.
Dr. J. P. Goodwin, Dinwiddie.

Ayrshires or Alderneys, of Native Stock—3d Class.

193. For the best bull, 3 years old and upwards $40 00
194. For the second best, 20 00
195. For the third best, CERTIFICATE OF MERIT.
196. For the best cow, 3 years old and upwards, 40 00
197. For the second best, 20 00
198. For the third best, CERTIFICATE OF MERIT.
199. For the best bull, between 2 and 3 years old, 20 00
200. For the second best, 10 00
201. For the third best, CERTIFICATE OF MERIT.
202. For the best heifer, between 2 and 3 years old, 20 00
203. For the second best, 10 00
204. For the best bull, between 1 and 2 years old, 20 00
205. For the second best, 10 00
206. For the best heifer, between 1 and 2 years old, 20 00
207. For the second best, 10 00
208. For the best calf or heifer, under 1 year old, 10 00

For the best *Imported Ayrshires* and *Alderneys*, same premiums as the above, but the *Imported* breeds shall compete only with their own class.

Judges.

Nathan Luffborough, Upperville.
Dr. John R. Woods, Albemarle.
F. T. Ridley, Southampton.
Ramsay McHenry, Maryland.
John Turpin, Petersburg.

Grades—4th Class.

209. For the best cow, 3 years old and upwards, 40 00
210. For the second best, 20 00
211. For the third best, CERTIFICATE OF MERIT.

212. For the best heifer, between 2 and 3 years old, $12 00
213. For the second best, 8 00
214. For the third best, CERTIFICATE OF MERIT.
215. For the best heifer, between 1 and 2 years old, 12 00
216. For the second best, 8 00
217. For the best heifer, under 1 year old, 5 00

This class includes the native stock or crosses of any of the foregoing breeds with the native stock.

Judges.

Dr. A. A. Campbell, Nottoway.
Henry B. Jones, Rockbridge.
T. Freeman Epes, Nottoway.
Josiah Dabbs, Halifax.
John Page (Millwood) Clarke.

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DAIRY COWS.

5th Class.

218. For the best cow for dairy, 40 00
219. For the second best, 20 00

Judges.

Wm. Miller, Winchester,
James Newman, Orange.
Edwin McCormick, Berryville.
Edward Hill, King William.
Henry Cox, Henrico.

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Working Oxen—6th Class.

220. For the best yoke of oxen over 4 years old, 30 00
221. For the second best, 15 00
222. For the best yoke of oxen under 4 years old, 30 00
223. For the second best, 15 00

The oxen to be tested according to rules to be prescribed by the Committee of Award.

Judges.

S. T. Stuart, Fairfax.
Chas. H. Carter, Nottoway.
Chas. H. Lynch, Lynchburg.
Wm. Strother Jones, Federick.
Edwin Edmunds, Prince Edward C. H.

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FAT STOCK—CATTLE.

7th Class.

224. For the best pair aged fat steers, 50 00
225. For the second best pair, 30 00
226. For the best pair of fat steers under 4 years old, $50 00
227. For the second best pair, 30 00
228. For the best pair fat cows or heifers, 50 00
229. For the second best, 30 00
230. For the best fat cow, over 4 years old, 25 00
231. For the second best, 15 00
232. For the best fat heifer, 25 00
233. For the second best, 15 00
234. For the best single fat steer, 25 00
235. For the second best, 15 00

The owner will be required to state the mode of fattening in all cases.

Judges.

Joseph Cloyd, Pulaski.
Sam'l H. Bell, Augusta.
Cloyd McGavock, Wythe.
Charles Grattan, Rockingham.
John W. Patteson, Middleburg.

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SHEEP AND SWINE—*8th Class.*

236. For the best pen fat sheep, 4 or more, 10 00
237. For the best pen fat hogs 4 or more, 10 00
238. For the best slaughtered mutton, 5 00

Judges.

H. Carrington Watkins, Chesterfield.
E. C. Robinson, Amelia.
Col. J. S. Clarke, Surry.
Dr. J. F. Early, Greene.
Wm. Patrick, Augusta.

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SHEEP.

FINE WOOL, OF NATIVE STOCK.

1*st Class—Including Spanish, Saxon, French, and Silesian Merinos.*

239. For the best ram, 20 00
240. For the second best, 10 00
241. For the third best, CERTIFICATE OF MERIT.
242. For the best pen of ewes, three in number, 20 00
243. For the second best, 10 00
244. For the third best, CERTIFICATE OF MERIT.
245. For the best pen of ewe lambs, 4 in number, 10 00
246. For the best pen of ram lambs, 4 in number, 10 00

Grades—2nd Class—Including the same varieties as 1st Class.

247. For the best pen of ewes, 3 in numbe., $20 00
248. For the second best, 10 00
249. For the third best, CERTIFICATE OF MERIT.
250. For the best pen of ewe lambs, 4 in number, 10 00

Judges.

Dr. R. C. Mason, Fairfax.
Wm. Garth, Albemarle.
G. W. C. Whiting, White Sulphur Springs.
J. G. Baylor, Prince George.
William Dillard, Surry.

MIDDLE WOOLS, OF NATIVE STOCK.

South Downs—3rd Class.

252. For the best ram, 20 00
253. For the second best, 10 00
254. For the third best, CERTIFICATE OF MERIT.
255. For the best pen of ewes, 3 in number, 20 00
256. For the second best, 10 00
257. For the third best, CERTIFICATE OF MERIT.
258. For the best pen of ewe lambs, four in number, 10 00
259. For the best pen of ram lambs, four in number, 10 00

South Down Grades—4th Class.

260. For the best pen of ewes, 3 in number, 20 00
261. For the second best, 10 00
262. For the third best, CERTIFICATE OF MERIT.
263. For the best pen of ewe lambs, 4 in number, 10 00

Oxford Downs—5th Class.

264. For the best ram, 20 00
265. For the second best, 10 00
266. For the third best, CERTIFICATE OF MERIT.
267. For the best pen of ewes, 3 in number, 20 00
268. For the second best, 10 00
269. For the third best, CERTIFICATE OF MERIT.
270. For the best pen of ewe lambs, 4 in number, $10 00
271. For the best pen of ram lambs, 4 in number, 10 00

Oxford Down Grades—6th Class.

272. For the best pen of ewes, 3 in number, 20 00
273. For the second best, 10 00
274. For the third best, CERTIFICATE OF MERIT.
275. For the best pen of ewe lambs, 4 in number, 10 00

Judges.

Raleigh Colston, Albemarle.
Philip N. Mead, Millwood, Va.
John A. Scott, Prince Edward.
John A. Lancaster, Buckingham.
Dr. R. C. Ambler, Markham Station.

LONG WOOLS, OF NATIVE STOCK.

7th Class.

276. For the best ram, 20 00
277. For the second best, 10 00
278. For the third best, CERTIFICATE OF MERIT.
279. For the best pen of ewes, 3 in number, 20 00
280. For the second best, 10 00
281. For the third best, CERTIFICATE OF MERIT.
282. For the best pen of ram lambs, 4 in number, 10 00
283. For the best pen of ewe lambs, 4 in number, 10 00

☞ The long wooled breeds include Bakewell or Leicester, Cotswold or New Oxfordshire and Lincoln.

Long Wool Grades—8th Class.

284. For the best pen of ewes, 3 in number, 20 00
285. For the second best, 10 00
286. For the third best, CERTIFICATE OF MERIT.
287. For the best pen of ewe lambs, 4 in number, 10 00

This class of Grades comprises any of the crosses of the above long wools on native stock.

Judges.

Dr. John B. Harvie, Powhatan.
Gen'l M. W. Ransom, Garysburg, N. C.
John H. M. Carter, Thoroughfare.
Edward Cunningham, Powhatan.

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FOREIGN SHEEP.

9th Class.

288. For the best imported Merino ram, $20 00
289. For the second best, 10 00
290. For the best imported Merino ewe, 20 00
291. For the second best, 10 00
292. For the best impor ed South Down ram, 20 00
293. For the second best, 10 00
294. For the best imported South Down ewe, 20 00
295. For the second best, 10 00
296. For the best imported Oxford Down ram, 20 00
297. For the second best, 10 00
298. For the best imported Oxford Down ewe, 20 00
299. For the second best, 10 00
300. For the best imported Bakewell or Leicester ram, 20 00
301. For the second best, 10 00
302. For the best imported Bakewell or Leicester ewe, 20 00
303. For the second best, 10 00
304. For the best imported Cotswold or New Oxfordshire ram, 20 00
305. For the second best, 10 00
306. For the best imported Cotswold or New Oxfordshire ewe, 20 00
307. For the second best, 10 00

Imported sheep not allowed to compete with natives.

☞ The judges of awards on fine wools will also adjudge the premiums on imported Merinos. The judges on middle wools, the premiums on imported South Downs and Oxfords, and the judges on long wools, the premiums on imported Bakewells and Cotswolds.

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Cashmere Goats—9th Class.

308. For the best pair Cashmere goats, male and female, 20 00
309. For the best pair, cross of Cashmere with native goat, CERTIFICATE OF MERIT.

Judges.

Mann P. Nelson, Jefferson.
James M. Sublett, Powhatan.
Capt William Nelson, Hanover.
John H. Flood, Appomattox.
Dr. S. P. Christian, New Kent.

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SWINE.

Large Breed.

310. For the best boar over two years old, $20 00
311. For the second best, 10 00
312. For the best boar 1 year old, 15 00
313. For the second best, 8 00
314. For the best breeding sow over 2 years old, 20 00
315. For the second best, 10 00
316. For the best sow not less than 5 months and under 18 months old, 15 00
317. For the second best, 8 00
318. For the best lot of pigs, not less than 5 in number, nor less than 2, and under 5 months old, and of the same litter, 10 00
319. For the second best, 5 00

The large breed includes Chester, Russia, Bedford, Woburn, Grazier, Hampshire, Duchess County, native and grades.

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Small Breed.

320. For the best boar over two years old, 20 00
321. For the second best, 10 00
322. For the best boar 1 year old, 15 00
323. For the second best, 8 00
324. For the best breeding sow, over 2 years old, 20 00
325. For the second best, 10 00
326. For the best sow, not less than 6 months nor more than 18 months old, 15 00
327. For the second best, 8 00
328. For the best lot of pigs, not less than 5 in number, nor less than 2 and under 5 months old, and of the same litter, 10 00
329. For the second best, 5 00

The small breed includes Neapolitan, Suffolk, Sussex, Essex, Berkshire, Chinese, natives and grades.

Judges.

E. C. Jordan, Jordan's Springs.
John F. Bootton, Madison.
John W. Dyer, Chesterfield.
E. G. Bagley, Macfarlands.
Wm. Benton, Jr., Middleburg.

Additional Premiums to Premium Animals.

330. For the best bull of any breed on exhibition,
331 For the best cow of any breed on exhibition,
332. For the best stallion of any breed on exhibition,
333. For the best brood mare of any breed on exhibition,
334. For the best ram of any breed on exhibition,
335. For the best ewe of any breed on exhibition,
336. For the best boar of any breed on exhibition,
337. For the best breeding sow of any breed on exhibition,

CERTIFICATE OF MERIT.

Judges.

Wm. C. Rives, Albemarle.
S. W. Ficklin, Albemarle.
Wm. M. Tate, Augusta.
Braxton Davenport, Jefferson.
Sam'l Bryerly, Berkeley.

POULTRY.

Chickens—1st Class.

338. For the best pair Cochin China, $2 00
339. For the best pair Imperial China, 2 00
340. For the best pair White Dorking, 2 00
341. For the best pair Red Chittagong, 2 00
342. For the best pair Gray Chittagong, 2 00
343. For the best pair Black Poland, 2 00
344. For the best pair White Poland, 2 00
345. For the best pair Silver Pheasant, 2 00
346. For the best pair Golden Pheasant, 2 00
347. For the best pair Spangled Hamburg, 2 00
348. For the best pair white or red game, 2 00
349. For the best pair Bramah Pootra, $2 00
350. For the best pair Virginia game, 2 00
351. For the best pair Black Spanish, 2 00
352. For the best pair Indian Mountain, 2 00
353. For the best pair Wild Indian game, 2 00
354. For the best pair Sumatra game, 2 00
355. For the best pair Ostrich game, 2 00
356. For the best pair Bolton gray, 2 00
357. For the best pair Sea-bright Bantam, 2 00
358. For the best pair Java Bantam, 2 00
359. For the best pair Great Malay, 2 00
360. For the best pair Jersey Blue, 2 00

Turkeys—2nd Class.

361. For the best pair common Turkeys, 2 00
362. For the best pair wild Turkeys, 2 00
363. For the best pair crested Turkeys, 2 00

Geese—3rd Class.

364. For the best pair common Geese, 2 00
365. For the best pair wild Geese, 2 00
366. For the best pair China Geese, 2 00
367. For the best pair Bremen Geese, 2 00
368. For the best pair Poland Geese, 2 00
369. For the best pair African Swan Geese, 2 00

Ducks—4th Class.

370. For the best pair of white Poland Ducks, 2 00
371. For the best pair Muscovy Ducks, 2 00
372. For the best pair Aylesbury Ducks, 2 00
373. For the best pair common Ducks, 2 00
374. For the best pair summer Wild Ducks, 2 00

5th Class.

375. For the greatest variety of Poultry by one exhibitor, $10 00

Judges.

Wm. M. Bagley, Lunenburg.
J. McL. Anderson, Caroline,
Rev. Jeremiah Porter, Richmond.
Daniel Dyson, Chesterfield.
Robert Tyler, Hanover, (Old Church.)

BRANCH IV.

AGRICULTURAL IMPLEMENTS.

Class I.

Ploughs, Cultivators, &c.

376. For the best 3 or 4 horse plough, $10 00
377. For the best 2 horse plough, 8 00
378. For the best single do. 5 00
379. For the best shovel do. 5 00
380. For the best sub-soil do. 5 00
381. For the best new-ground or coalter plough, 5 00
382. For the best hill-side plough, 5 00
383. For the best cultivator for corn, 5 00
384. For the best cultivator for tobacco, 5 00
385. For the best cultivator for two horses, 5 00
386. For the best wooden-frame harrow, 6 00
387. For the best iron-frame harrow, 6 00
388. For the best drain and furrow plough for opening and cleaning out water furrows, $10 00

Judges.

John H. Stokes, Lunenburg.
Z. R. Lewis, Albemarle.
John Coleman, Halifax.
J. W. McPhail, Charlotte.
Richard V. Gaines, Charlotte.

Class II.

Drills, Broadcasters, &c.

389. For the best broadcasting or drilling machine for sowing grain or grass seed, $20 00
390. For the best wheat drill, 20 00
391. For the best broadcasting machine for sowing guano, $20 00
392. For the best lime spreader, 20 00
393. For the best corn planter, 10 00
394. For the best seed drill, 3 00
395. For the best attachment to drill for drilling guano, 15 00
396. For the best implement for sowing and covering peas among corn, at or immediately following the last tillage, and either with or without guano, 15 00

Judges.

Ths. J. Randolph, Albemarle.
Robert Douthat, Charles City.
Dr. Robert Harrison, Prince George.
F. Lewis Marshall, Fauquier.
B. W. Leigh, Mecklenburg.

Class III.

Wagons, Carts, Harness, &c.

397. For the best wagon for farm use, $10 00
398. For the best dumping wagon, 10 00
399. For the best horse cart, 8 00
400. For the best ox cart with iron axle, 10 00
401. For the best wagon body, or ladder, for hauling wheat in the sheaf, or hay, or straw, may be exhibited by model, 5 00
402. For the best set of wagon harness, 5 00
403. For the best harness for horse cart, 2 50
404. For the best ox yoke, 2 50

Judges.

Charles Friend, Prince George.
Col. Joseph Tuley, Clarke.
Col. Isaiah Dabbs, Halifax.
E. R. Turnbull, Brunswick.
Fielding L. Taylor, Gloucester.

Class IV.

Rollers, Clod Crushers, and Farm Gate.

405. For the best smooth roller, $10 00
406. For the best pegged roller, to be exhibited by model, 10 00
407. For the best clod crusher, 10 00
408. For the best farm gate, including hinge and fastening, to be exhibited by model, 5 00

Judges.

John A. Scott, Farmville.
Julian C. Ruffin, Prince George.
Wilson Winfree, Powhatan.
Dr. Richard Haskins, Brunswick.
Dr. Richard Epps, Prince George.

Class V.

Horse Powers, Threshers, Separators, &c.

409. For the best sweep horse power, $25 00
410. For the second best sweep horse power, 10 00
411. For the best threshing machine, 20 00
412. For the best machine for threshing, cleansing and separating wheat at one operation, 30 00
413. For the best machine for gathering clover seed, 20 00
414. For the best machine for hulling and cleansing clover seed, 20 00

Judges.

William Irby, Lunenburg.
James Beazley, Greene.
Thomas Bruce, Halifax.
W. H. Anderson, Prospect Depot.
John Haw, Hanover.

Class VI.

Straw and Root Cutters, Corn Shellers, Mills, &c.

415. For the best hay or straw cutter for horse power, $10 00
416. For the best hay or straw cutter for hand power, 5 00
417. For the best horse power cutter, for cutting cornstalks for fodder, 15 00
418. For the best corn sheller for horse power, 10 00
419. For the best corn sheller for hand power, 5 00
420. For the best grist mill for horse power, 10 00
421. For the best saw mill for farm use, 10 00
422. For the best corn and cob crusher, 10 00
423. For the best root cutter, 2 50
424. For the best steam boiler for cooking food for stock, 20 00

Judges.

S. S. Gresham, King & Queen.
Dr. Rob't A. Patteson, Littleton, N. C.
John Harris, Mansborough, N. C.
John Hunter, Louisa.
Dr. C. D. Everett, Everettsville, Alb.

Class VII.

Fan Mill, Hay Press, Ditching Machine, &c.

425. For the best fanning mill, $10 00
426. For the best hay press, 15 00
427. For the best stump machine, 30 00
428. For the best ditching machine, 30 00
429. For the best rotary digger, 30 00
430. For the best steel spade fork, 2 00
431. For the best horse rake for hay, 5 00
432. For the best gleaner, 3 00
433. For the best brier hook, 1 00

Judges.

Henry Stokes, Prince Edward.
William C. Graves, Orange.
George Watt, Richmond.
John Taylor, Jr., Culpeper.
John C. R. Taylor, Albemarle.

Class VIII.

434. For the most extensive and valuable collection of useful machines and implements exhibited and made at any one factory, whether including subjects for other premiums or not, a premium of $25 00

Judges.

Judge Thomas Ruffin, North Carolina.
Edwin G. Booth, Nottoway.
P. P. Nalle, Culpeper.
William J. Watkins, Charlotte.
John Rowlett, Petersburg.

Class IX.

Miscellaneous.

435. For the best pump adapted to deep wells, $10 00
436. For the best water ram in operation, 10 00
437. For the best scoop or scraper, 10 00
438. For the best leveling instrument, suitable for draining operations, 10 00

439. For the best churn, $4 00
440. For the best sausage cutter, 2 00
441. For the best washing machine, 2 00
442. For the best sewing machine, 10 00
443. For the best machine for shearing sheep, 10 00
444. For the best tide gate or model of same, 10 00

Judges.

Edward Friend, Dinwiddie.
John G. Powell, Nottoway.
Dr. M. L. Anderson, Albemarle.
Frank P. Wood, Prince Edward.
Richard Stokes, Prince Edward.

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CLASS X.

Agricultural Steam Engine.

445. For the best steam engine, applicable to agricultural purposes generally, as a substitute for horse power, $25 00

Judges.

William Allen, Surry.
Edward H. Herbert, Princess Anne.
H. E. Shore, Nottoway.
William Benton, Jr., Loudoun.
Col. R. S. Neblett, (Bl'k Face,) Nottoway.

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CLASS XI.

Ploughing Match.

446. For the best ploughman with horses, $10 00
447. For the second best ploughman with horses, 5 00
448. For the best ploughman with steers, 10 00
449. For the second best ploughman with steers, 5 00
450. For the best dynamometer, 10 00

Judges.

Edward A. Marks, Prince George.
William Michaux, Powhatan.
William H. Turnbull, Dinwiddie.
Dr. William J. Cheatham, Amelia.
Robert M. Taylor, Henrico.

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CLASS XII.

Trial of Ploughs.

451. For the best 2 horse plough, adapted to the section in which trial is to be instituted, $20 00
452. For the best three or four horse plough, adapted to the section in which trial is to be instituted, $20 00

There shall be three separate trials of ploughs—one for the Tide-water, one for the Piedmont, and one for the Trans-montane sections of the State. These trials shall be held respectively, after due public notice, at such times and places as shall be appointed by the chairman of the Committee of Award for the section in which the trial is to be made.

The judges will award the premiums offered, only to such implements as may be deemed fully worthy of that distinction.

The relative merits of all the ploughs submitted for trial shall be tested upon each of the several points contained in the following scale, and full report thereof shall be made to the Executive Committee.

SCALE OF POINTS FOR PLOUGHS.

1. *Economy of Power,* or the least resistance to draught, according to depth and width of furrow,	20
2. *Facility in Changing the Set,* so as to give more or less land, or greater or less depth, without disturbing the proportionate width of furrow, and without alteration of harness,	10
3. *Steadiness of Action,* with as little labor to the ploughman as comports with the proper control and guidance of the plough,	10
4. *Adjustment of all the parts in harmonious relation to each other,* so that each shall duly perform its appropriate function,	15
5. *Effectiveness of Operation,* cutting a furrow, the width of which shall bear a due proportion to the depth thereof, and also cutting the furrow slice of uniform thickness, and lifting and turning it at the proper angle, with the least degree of friction,	25
6. *Strength, durability and simplicity of construction,*	10
7. *Price and facility, and economy of repairs,*	10
	100

Judges.

TIDE-WATER.

James M. Willcox, Chairman, Charles City.
[The Chairman to choose his associates.]

PIEDMONT.

Richard H. Carter, Chairman, Fauquier.
[The Chairman to choose his associates.]

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TRANS-MONTANE.

Chas. Grattan, Chairman, Rockingham.
[The Chairman to choose his associates.]

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Class XIII.

Trial of Reaping and Mowing Machines.

453. For the best reaping machine, $25 00
454. For the best mowing machine, 20 00
455. For the best grain cradle, 5 00

Judges.

Tucker Carrington, Clarksville.
J. Randolph Bryan, Gloucester.
Thos. M. Bondurant, Buckingham.
James Vest, Louisa.
J. Marshall McCue, Augusta.

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BRANCH V.

ORCHARD AND GARDEN PRODUCTS.

Class I.

Fruits and fruit trees.

456. For the best and largest variety of apples suitable for Southern raising, each labeled, $10 00
457. For the best and largest variety of pears, 8 00
458. For the greatest number of choice varieties of different kinds of fruit, 10 00
459. For the best and largest collection of apple trees, suitable for Southern raising, 10 00
460. For the best pear trees, 10 00
461. For the best peach trees, 10 00
462. For the best fig trees, 5 00
463. For the best grape vines, 5 00
464. For the best strawberry vines, 3 00
465. For the best raspberry plants, 3 00
466. For the best bushel dried apples, 3 00
467. For the best bushel dried peaches, 3 00
468. Model or drawing of the best kiln for drying fruit, 10 00

Judges.

Yardley Taylor, Loudoun.
Paul C. Venable, Mecklenburg.
Col. Wm. P. Tate, Greensville.
H. C. Williams, Fairfax.
Henry J. Smith, Henrico.

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Class 2nd.

Flowers.

469. For the largest and choicest collection of plants, $10 00
470. For the second best, 5 00
471. For the best and greatest variety of dahlias, 2 00
472. For the best twelve dahlias, 2 00
473. For the greatest variety of roses, 5 00
474. For the best twenty-five roses, 2 00
475. For the best and largest collection of chrysanthemums, 3 00
476. For the best floral ornament, 5 00
477. For the best hand bouquet, not more than eight inches in circumference, 2 00
478. For the best and largest collection of verbenas in bloom, 3 00
479. For the best and largest collection of evergreens, 5 00
480. For the best and largest collection of hardy flowering shrubs, 5 00

Judges.

Rev. A. J. Leavenworth, Petersburg.
Paul Lemoine, do.
Robert B. Bolling, do.
Thomas S. Gholson, do.
Dr. J. T. Pretlow, Southampton.

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Class 3rd.

Vegetables.

481. For the largest and best assortment of table vegetables, $10 00
482. For the best dozen long blood beets, 2 00
483. For the best dozen head of cabbage, 2 00
484. For the best dozen cauliflower, 2 00
485. For the best dozen broccoli, 2 00
486. For the best dozen carrots, 2 00

487. For the best dozen egg plants, 2 00
488. For the best peck of onions, 2 00
489. For the best dozen parsnips, 2 00
490. For the best bushel of Irish potatoes, 2 00
491. For the best bushel of sweet potatoes, 2 00

Judges.

Wm. Ayres, Petersburg.
Joseph Sinton, Henrico.
Henry Irvin, Norfolk.
Thomas Gentry, Prince George.
James R. Read, Dinwiddie.

BRANCH VI.

Butter, Cheese, Bacon, Honey, &c.

CLASS 1st.

BUTTER AND CHEESE.

492. For the best specimen of fresh butter, not less than ten lbs., 10 00
493. For the second best specimen of fresh butter, not less than five pounds, 5 00
494. For the best firkin or tub of salted butter, not less than 6 months old, 10 00
495. For the second best firkin or tub of salted butter, not less than 6 months old, 5 00
496. For the best cheese, not less than 20 pounds, 10 00

The method of making and preserving the butter and cheese to be stated by the exhibitor.

Judges.

Daniel Lyon, Petersburg.
T. M. Ambler, Fauquier.
Ed. O. Watkins, Chesterfield.
Wm. C. Hume, Orange.
W. B. Ross, Culpeper.

CLASS 2d.

Honey, Bee Hives, and Bacon Hams.

497. For the best specimen of honey, not less than ten pounds, 5 00

The honey to be taken without destroying the bees—the kind of hives used, and the arrangement of the bees to be stated by the exhibitor.

498. For the best bee hive, 10 00
499. For the best ham, cured by exhibitor, $8 00
500. For the second best, 4 00

Manner of curing to be described by exhibitor, and the hams exhibited to be cooked.

Judges.

Alex. Garrett, Richmond.
John F. Whitfield, Powhatan.
Wm. B. Green, Dinwiddie.

BRANCH VII.

Household and Domestic Manufacture.

HOUSEHOLD MANUFACTURES.

CLASS 1st.

501. For the best quilt, 5 00
502. For the second best quilt, 4 00
503. For the best counterpane, 5 00
504. For the second best counterpane, 4 00
505. For the best pair home-made blankets, 5 00
506. For the best home-made carpet, 5 00
507. For the best home-made hearth-rug, 3 00
508. For the best set home-made curtains, 5 00
509. For the second best set home-made curtains, 3 00
510. For the best piece, not less than 7 yards home-made negro shirting, 3 00
511. For the best piece, not less than 10 yards, winter clothing for negroes, to be woven by hand, 5 00
512. For the best piece, not less than 10 yards, heavy woollen jeans, to be woven by hand, 5 00
513. For the second best piece not less than 10 yards, heavy wollen jeans, to be woven by hand, 3 00
514. For the best piece linsey, not less than 7 yards, to be woven by hand, 5 00
515. For the second best, 3 00

Judges:

A Committee of Ladies.

CLASS 2d.

516. For the best fine long yarn hose, 3 00

517. For the best fine long cotton hose, $3 00

518. For the best silk hose of home-made silk, 5 00

519. For the best specimen of home-made wine, 5 00

520. For the best home-made bread, 5 00

521. For the best home-madé pound cake. 3 00

522. For the best home-made sponge-cake, 3 00

523. For the best varieties home-made pickles, 3 00

524. For the best varieties home-made preserves, 3 00

525. For the best varieties home-made fruit jelly, 3 00

526. For the best 5 pounds maple sugar, 5 00

527. For the best sample home-made soap, the process of making to be described by the exhibitor, 5 00

Judges.

A Committee of Ladies.

LADIES' ORNAMENTAL AND FANCY WORK.

Class 3d.

528. For the best specimen of embroidery, 8 00

529. For the second best, 6 00

530. For the best specimen of worsted work, 8 00

531. For the second best, 6 00

532. For the best specimen of crochet work, 8 00

533. For the second best, 6 00

534. For the best specimen of wax work, 8 00

535. For the second best, 6 00

536. For the best specimen of shell work, 8 00

537. For the second best, 6 00

538. For the best specimen of ornamental leather work, 8 00

539. For the second best, 6 00

540. For the best specimen of block work, 8 00

541. For the second best, 6 00

542. For the best specimen of knitting, 8 00

543. For the second best, 6 00

544. For the best specimen of netting, 8 00

545. For the second best, $6 00

546. For the most extensive variety of useful, ornamental and fancy work, not excluding articles which may have had premiums awarded them under any of the above specifications, 10 00

Judges.

A Committee of Ladies.

DOMESTIC MANUFACTURES.

Class 1st.

547. For the best flour of white wheat,

548. For the best flour of red wheat, Certificate of Merit.

Judges.

David H. Branch, Petersburg.
Andrew Kevan, do.
Asa M. Janney, Richmond.
Branch T. Hurt, Petersburg.
Wesley Grigg, do.

Class 2d.

549. For the best manufactured tobacco, Certificate of Merit.

Judges.

Nathaniel Blick, Petersburg.
Geo. P. Holman, Fluvanna.
William Martin, Henry,
V. Witcher, Pittsylvania.
Samuel Williams, Petersburg.

Class 3d.

550. For the best pair of bed blankets,

551. For the best pair of servant's blankets,

552. For the best of piece woollens,

553. For the best of piece cotton cloth.

554. For the best piece of cloth or webbing, suitable for horse collars and harness,

555. For the best and greatest variety of coarse, strong, and cheap shoes,

556. For the best and cheapest wool hats,

557. For the best collection of coarse wollen fabrics for farm purpose,

Certificate of Merit.

558. For the best and cheapest negro brogues, 10 00

Judges.

T. M. Leitch, Buckingham.
James M. McNutt, Farmville.
James P. Marshall, Charlotte.
Col. D. A. Weisiger, Petersburg.
Josephus Hurt, do.

BRANCH VIII.

Honorary Testimonials to each individual of Virginia who, previous to 1859, has discovered or introduced, or brought into use any principle process, or facility generally, or any improvement by which important value has been gained for the Agricultural interests of Virginia.

Judges.

N. Francis Cabell, Nelson,
William C. Rives, Albemarle.
Wm. B. Harrison, Prince George.
Thos. J. Randolph, Albemarle.
R. M. T. Hunter, Essex,
John Todd, Isle of Wight.
J. Mayo, Westmoreland.
Wm. S. Simpson, Petersburg.

BRANCH IX.

CLASS 1st.

Special Premiums for any useful subjects not embraced under any of the foregoing heads.

559. Discovery in Virginia of mineral phosphate of lime in sufficient quantity to be valuable for sale and distant transportation as manure, a premium of $50 00

If more than one claimant, the most valuable discovery to have the award.

Judges.

Julian C. Ruffin, Prince George.
Fielding L. Douthat, Charles City.
Wm. S. Simpson, Petersburg.

CLASS 2nd.

560. For the successful and economical application, in actual operation, of steam-power to tillage purposes, as a substitute for team or animal power—to draw or work plows, harrows, rollers, clod-crushers, or any substitutes thereof, operating either to break, subvert, or pulverize the soil, or otherwise to prepare it for putting in seed, or for the production of crops on level or moderately undulating land—a premium of $500

As conditions necessary for competing for or obtaining the above premium: It shall be required by the judges that full trials shall be made of the implements or machines offered, in practical labours and performance, and for as much time, before or after the annual exhibition as shall be deemed proper by the committee of award. Also that the operation shall be considered economical and profitable, and more so than the use of team labour for the same purposes, and on fields not less than fifty acres of size.

Should there be more than one machine competing for this premium, it will be awarded to the best, (if deserving it by sufficient merit,)—or if two be deemed deserving and of equal claims of merit, the premium shall be divided equally between them.

Any person designing to compete must notify the Secretary of the Society (at Richmond, Va.,) of his intention at least forty days before the Exhibition, and he will then be notified when and where (on James river,) the machine must be brought and tried. It must also be exhibited on the Fair Grounds during the Exhibition of the Society.

Judges.

Wm. B. Harrison, Prince George.
Wm. C. Knight, Nottoway.
Robert Douthat, Charles City.
John A. Selden, do.
Richard Irby, Nottoway.
Wm. W. Gilmer, Albemarle.
Edmund Ruffin, Jr., Prince George.

CLASS 3rd.

561. For the best plan of preserving wheat from the time of harvest until it is sent to market, including shocking, stacking, and securing against weavil—to have been tested by satisfactory personal experience, and to be accompanied by full and accurately written descriptions and drawings, if necessary, $50 00

Judges.

THE EXECUTIVE COMMITTEE.

Class 4th.

562. For the best dozen baskets of different kinds, made in Virginia, of Virginia grown material, $5 00

563. For the best set of plantation hampers and baskets, not less than three in number, 5 00

Judges.

James C. Gates, Chesterfield.
Henry Cox, Henrico.
Wm. C. Jones, Surry.
Thos. Jones, Richmond County.
Col. Alex. Fleet, King & Queen.

BRANCH X.

DISCRETIONARY PREMIUMS.

Judges.

Richard Irby, Nottoway.
Henry T. Garnett, Westmoreland.
Dr. W. H. Perry, Lunenburg,
Alex. Donnan, Petersburg.
B. Johnson Barbour, Orange.

American Hydraulic Cements.

Not many years ago all the roman and hydraulic cements used for our public works were imported from England, but at present very little foreign cement is employed, as our engineers consider the American superior in quality for most purposes. One reason for this preference is the freshness of the home product; it can always be procured when newly ground, whereas foreign cement becomes somewhat impaired in its energy by its transport across the ocean, where the atmosphere is very humid. By exposure to a humid atmosphere, hydraulic cement absorbs carbonic acid and moisture, which injure its adhesive and *quick-setting* qualities. Messrs. Delafield & Baxter, Wall-street, this city, who manufacture the famous Rosendale hydraulic cement, inform us that it will keep for a year or more in tight barrels lined with paper, as they put it up, when protected from a moist atmosphere. They have also furnished us with information in preparing this cement for use, which we know will be useful to many of our readers. As it sets rapidly on exposure and under water, it should only be mixed in such quantities as are required for immediate use; a sufficient quantity of water is employed to make it into a paste of moderate thickness, care being exercised to wet it thoroughly. The sand most suitable for mixing with it should be free from organic and other impurities, and should consist of fine, sharp grains of silica. The use of sand in cement and mortar is to prevent rapid shrinkage, also exposure of the cement on a greater surface; its office is a mechanical, not a chemical one. Experienced engineers in charge of public works usually mix their cement in the proportion of one part of cement to one and a half or two of sand. Others sometimes mix three or four parts of sand to one of cement. All cements (mortars also) should, if possible, be prepared under cover, to prevent their drying too rapidly in warm weather. The stone or brick to be cemented should be free from dirt and well moistend, otherwise they will absorb the moisture from the cement, and prevent the adhesion of its particles during the process of crystallization.

Hydraulic cement is chiefly useful as a mortar for works under water, and for walls of buildings under ground. In making concrete foundations with it, one and a half parts of sand to one cement should be made up to the consistency of good mortar, and one measure of it to three of broken stones or brick are about the proper proportions that should be used. The whole of the concrete should be laid as rapidly as possible, and finished in sections, well rammed, so as to have the whole work formed into one solid mass, and of an even surface, before it sets, when it should be left undisturbed until it hardens; and if it is exposed in a dry place, it should be moistened occasionally with a little water. Very cold weather is injurious to the energy of cement; in northern latitudes it loses energy during a low temperature, and remains inert until the return of warm weather. Inexperienced persons unacquainted with this fact have condemned the best cements by applying them in the wrong season.—*Scientific American.*

Animalcules have been discovered so small that 1,000,000 would not exceed a grain of sand, and 500,000,000 would sport in a drop of water; yet each of these must have blood vessels, nerves, muscles, circulating fluids, etc., like large animals.

Proceedings in the Laboratory.

By PROFESSOR ANDERSON, M. D., *Chemist to the Highland and Agricultural Society of Scotland.*

ON THE COMPOSITION AND VALUE OF FISH-MANURE.

Some years since, public attention was directed to the large quantities of fish unsuited for human food, and of offal collected at the large fish curing-establishments existing in various parts of the coast. The good effects obtained by their application as manure by farmers in the neighbourhood, suggested the importance of converting them into a portable form, so as to insuro the use of that large proportion for which there existed no demand in their natural state; and it was pointed out that if this could be done, the supply of refuse fish might be greatly increased, it being at present a common practice among fishermen to throw into the sea all the inedible fish, whereas if a demand existed for them, they would all be brought to shore. The result of this suggestion was, that a large number of patents for methods of treating fish and offal were taken; but few, if any, of them have come into operation on the large scale, and, at all events, the manufacture has attained no extension, and the prospects of an abundant supply of manure from this source are at the present moment as distant as ever. The principal cause of this result appears to be the too great complexity of the methods of manufacture which were suggested, and which required, in many instances, expensive and complicated machinery, or too costly materials. The former of these is a difficulty of the most serious character, because there are few, if any, places where the supply of fish is sufficiently large to enable expensive machinery to be worked with profit; and the irregularity of the supply, and the total cessation of fishing, during a considerable part of the year, render it impossible to carry on the works with that regularity which is the soul of all manufacturing processes in which machinery is employed.

As a necessary consequence of these expensive processes, the cost of the manure produced was excessive; and farmers, contrasting it with guano and other manufactured manures, and finding that they were materially cheaper, naturally evinced a preference for those which they had been accustomed to use, and refused to give a price which would remunerate the manufacturer.

The failure of these processes, however, should not lead to the conclusion that it is impossible tò convert fish into a dry manure, but should rather direct attention to the contrivance of simpler and easier processes. The truth is, that there has been a great deal of misunderstanding as to what is required to make such substances portable. The manufacturers are rarely familiar with the principles of the art they practise, and being strongly impressed with the importance of rendering manures soluble, have most commonly made treatment with sulphuric acid in some way or other a fundamental part of their process; whereas, in this case, at least, all that is requisite is to remove the water, and to reduce the dry residue to a pulverulent state. To effect this object, no complicated apparatus is necessary, all that is required being a stove or flat drying surface, heated either by a small furnace, with flues passing backwards and forwards, or by means of steam, the latter being preferable. A thin layer of the moist fish or offal being laid upon this, might be rapidly dried and converted into a proper state before putrefaction commenced, and a manure be produced which would have comparatively little smell. As regards its value, there is some difficulty in forming an opinion; but some guide may be afforded by reference to the composition of such manures of this kind as have appeared in the market, analyses of several of which have at different times been made in the laboratory. The first of them to which I shall refer are two samples made on the east coast of England, by a process, with the nature of which I am unacquainted They were found to contain:—

	I.	II.
Water,	9.77	12.15
Organic matter,	53.55	55.27
Phosphates,	4.72	6.44
Sulphate of lime,	1.63	1.71
Common salt,	26.49	22.29
Sand,	3.84	2.14
	100.00	100.00
Ammonia,	6.20	7.63

If we estimate these according to the plan used for guanos, then No. I. is worth about £4, 12s., and No. II., £5, 10s. per ton,—values which are certainly not very high. We must take into account, however, the large quantity of common salt, which materially reduces the value; and if it were possible to exclude this substance, which we shall immediately see can be done, then the value of these samples would be about £5, 15s., and £6, 18s. respectively.

Another sample, the source of which I have been unable to ascertain, but which I believe to have been offered for sale in Liverpool, contained:—

Water,	7.55
Organic matter,	87.45
Phosphates,	0.55
Carbonate of lime,	0.45
Alkaline salts,	2.55
Sand,	1.45
	100.00
Ammonia,	7.29

The absence of common salt in this case, except to a very small extent in the alkaline salts, shows the possibility of producing a manure without that substance; but in this case the value is somewhat lower, owing to the trifling proportion of phosphates. It does not exceed £4, 16s. per ton. It is probable that in this case some charcoal or other organic matter had been mixed with the fish, with the view of its acting as an antiseptic during the process of manufacture; but on this point I am unable to speak positively.

The last sample to which I shall refer was manufactured on the Portuguese coast, whence it was imported into this country. It is of a totally different nature from the others, sulphuric acid having obviously been used to some extent in the process, and sulphate of lime apparently added as a drier. For this reason its value must be estimated on the same principle as that of a superphosphate, which indeed, it somewhat resembles in composition.

Water,	14.04
Organic matter,	27.77
Biphosphate of lime equivalent to 7.00 bone-earth made soluble,	4.48
Insoluble phosphates,	1.60
Sulphate of lime,	36.17
Alkaline salts,	6.14
Sand,	9.80
	100.00
Ammonia,	2.10

This manure is worth only £3, 16s. per ton, and this value is chiefly derived from the biphosphate of lime it contains.

Fish-manures have usually been offered for sale at from £8 to £9 per ton; and at this price there is obviously no inducement to buy them, and hence the failure of the manufacture. But it is still a question whether, setting aside all complex processes, and simply confining the process to drying the fish and offal, it might not be possible to produce a manure which could be sold at a price sufficiently low to create a demand. The point on which this must mainly depend, is the price at which the raw material can be obtained. At present we believe fish-refuse may be got for 8s. or 10s. per ton; and as it will require four or five tons to make one ton of manure, the raw material may be taken to cost about £2 per ton; and allowing the same sum for the cost of manufacture, the price at the works would be £4 per ton, which would be increased, by retailer's profit, &c., to £6 when it came into the hands of the farmer. This price would exceed the value of any of the samples of which the analyses have been given above; but then it is probable that the quality of the manure would also greatly exceed any of them; in fact, if properly manufactured, it can scarcely be doubted that a manure fully equal to that value might be produced. It is extremely desirable, for the interests of agriculture, that some trial should be made, so as to ascertain whether it be practicable to produce such a manure with profit. One thing, however, is certain, that if it is to be done at all, it ought not to be taken up as a separate branch of manufacture, but should be carried out by the fish-curers, who ought to convert their own refuse into manure. Any other plan involving, as it must necessarily do, considerable cost in transporting the raw material from one place to another, is not likely to succeed. On the coast of Scotland, there are many places where abundance of fish is to be obtained; and it is much to be desired that some enterprising persons could be found to make a trial of this manufacture.

Another Death from Hydrophobia. A large dog, raving with hydrophobia, passed through the upper part of Orange, N. J., last week, biting a number of other dogs, several cows, and a little girl on the heel, lacerating it very much. Dr. Wm. Peterson was called, and opened her leg, using every effort to save her life, but was unable to effect a remedy, and she died.

From Jackson's Agriculture and Dairy Husbandry.

On Manures.

By repeated cropping, the best soils become exhausted of their fertile properties, while naturally indifferent soils require the administration of certain qualities, before they will yield a due return to the labors of the husbandman. There are, no doubt, soils so naturally rich in some parts of the world, that though used for twenty or more years in growing successive grain crops, they show no indication of impoverishment; yet even these must in time be exhausted, and therefore, in all circumstances, manures or artificial fertilizers, require the consideration of the husbandman. In our own country they are of the first importance.

Manures are of two classes, both of which have distinctive characters, and perform different offices in the economy of vegetation. The first of these comprehends all animal and vegetable decomposing matter, and is principally employed in feeding the plant, augmenting its size, and sustaining the vital energy. The second operates more on the soil and decomposing matter than in directly contributing to the support of the vegetable. The first kind has been called animal and vegetable, and the second fossil, manures. Under this second class are ranked not only lime, marl and gypsum, but sand, gravel and clay, so that all the meliorations which are effected on soil by blending and compounding the original earths, are compressed within its limits.*

The animal and vegetable manures, which are putrescent in their nature, are foremost in importance and dignity. They consist of certain elementary parts of animal and vegetable substances, elaborated by a natural chemical process in the course of the decomposition or decay of the bodies. The excrementitious matter, or dung of all animals, is no other than the remains of the vegetable or animal food which has been received into the stomach, undergone there a partial dissolution, and been thrown out as unservicable for the further nutrition of the system. From this universal decay of organised matter, and its conversion into fluids and gases, it would seem that animal and vegetable substances, and excrementitious matter, are resolvable into each other, and are only different parts of the same original principles. The essential elements of them all are hydrogen, carbon and oxygen, either alone, or in some cases united with nitrogen. Conveyed by liquids or moist substances into the ground, these elements are sought for as nourishment by the roots of plants, and so form the constituent principles of a new vegetation. Inasmuch as flesh consists of a greater concentration of these original elements than vegetables, the manure produced by carnivorous animals (man included) is always more strong in proportion to its bulk than that discharged by animals who live only on herbage. Experience fully proves that all animal and vegetable manures are but varieties of one kind of principles; their actual shape and appearance being of much less consequence than the degree of strength in which these principles reside in them.

Whatever be the value of the elementary principles of manures, practically they are of no use as a manure till they are disengaged by putrefaction. Putrefaction or decomposition is a beneficent destroying principle in nature. If the animal or vegetable substance do not putrefy or decay, it is of no more use in the ground than a stone. For the sake of illustration, take a piece of peat. It is an inert vegetable mass, composed of successive layers of vegetation, and preserved from putrefaction by water, and certain antiseptic qualities in its substance. As it exists in this preserved condition, it is valueless as a manure; it can form only an unfermented and living dung-hill. But when we remove it from its native bog, expose it to the atmosphere, and artificially bring on decomposition, or destruction of the living fibre, its character is at once changed, and we realise what may possibly be a nutritious manure.

It may be further observed, that putrefaction is in every instance produced by the elementary principles being set at liberty either in a fluid or volatile state. If a quantity of stable-dung be piled into a heap, and freely exposed to all varieties of weather, it soon heats and emits a stream of vapor, which is often visible as a cloud over it. These vapors, and also the odors which it sends forth, are gases escaping, and the heap is constantly diminishing in weight and volume; at the end of six months, if there have been alternate moisture and warmth, not above a fourth of the original essential material remains to be spread on the field;

*Young's "Letters of Agricola."

there may be in appearance nearly as much substance, but it is comparatively of little value—the real manure is gone, and what remains is little better than a mass of unputrefied rubbish.

It may be safely averred, that no principle connected with agriculture is so little understood or thought of, as that which has been now mentioned. We therefore crave the most earnest attention to it by every reader of these pages. Generally speaking, the excrementitious matters thrown to the dung-hill are treated with perfect indifference as to the effects of exposure and drainage away in the form of liquids. It cannot be too strongly stated that this is a gross abuse in farming, which cannot be too speedily remedied. The putrescent steam contains the very essence of the manure, and should either be scrupulously confined within the limits of the dung-hill, or conveyed to fresh vegetable or earthy matter, that it may impart its nutritive qualities.

The earth is a powerful absorber of all the gases which arise from putrefaction, whether in solids or liquids. It is remarked, that the odor proceeding from the dissolution of organised matter never rises through the ground to assail the nostrils. A strongly dunged field, after being ploughed, sown and harrowed, sends forth a healthful and refreshing smell—a proof that all the putrid vapors, which otherwise would annoy us, are absorbed and retained for the nutrition of the crop. It is on this account that the poorest earth can be enriched in a very high degree by mere exposure to the gases of putrefaction. Put a layer of common soil along the top of a fermenting dung-hill, from twelve to eighteen inches thick, and allow it to remain there while the process is carrying on with activity, and afterwards separate it carefully from the heap, and it will have become impregnated with the most fertilizing virtues.*

A knowledge of this important truth has led to the practice of making compost dung-heaps, in which the valuable liquids and gases of different kinds of manure are absorbed by earth, or some other substance, and the whole brought into the condition of an active manure for the fields. Hitherto, it has been customary to speak of dung-hills, but there ought to be no such objects. The collection of manure from a farm-yard and offices, should form a dung-*pit*, not a dung-*hill;* and the manner of making and managing the contents of this pit on the best principles is well worthy of our consideration.

FARM-YARD MANURE.

The situation of the dung-pit should be near the stables and cow-houses, and placed so low that all streams of urine from them should flow at once into it, so that nothing be lost. It may be three or four feet deep, and of a size proportionate to the stock of cattle usually kept by the farmer. It is not necessary that it should be built round with a wall, or have a perpendicular descent, as it may slope gently inwards, and deepen gradually towards the centre. It should, if possible, be covered by a roof, to prevent the action of the sun. If the bottom be found firm, impervious, and capable of containing the juices, no further trouble is requisite, and the work is complete; in many instances, however, it will be necessary to first puddle with clay, and then line the bottom with flag-stones. Into this pit, earth, with refuse straw, should be brought, and strewed over the bottom and sloping sides, to the thickness of from nine to twelve inches, and this will form an inferior layer to absorb all that portion of the liquid manure which naturally runs to the bottom. The pit is now prepared to receive all kinds of animal and vegetable manure, which, when brought, should always be laid evenly over the surface. In Scotland, such dung-pits are common, and in the course of accumulation, a young or wintering stock of cattle is allowed to go at large upon the whole; the animals being at the same time fed on a proper allowance of straw. Care is also taken to mix, in laying on, the dung brought from the cow-house, stable and piggeries, so that the rich excrement of the well-fed animals may be incorporated with that of a poor description from others. It is likewise of the utmost importance, though too frequently neglected, to convey to the pit the entire liquid refuse of the farm-yard, provided the quantity be not so great as to make it advisable to have a separate pit for its reception.

It is customary to cart away the material of the dung-pit at convenient opportunities, (usually during the frosts in winter,) to a place in the fields, near where it is to be used, and there pile it up in a quadrangular

* Young's "Letters of Agricola."

heap of about four feet in height. * * * * It may, however, be stated, that for want of attention to principles already explained, such dung-heaps, by exposure for months to the weather, must lose some of their valuable properties. In every instance, the dung-heap in the fields should be placed in a hollow situation, with a substratum of earth, and should have a scattering of a few inches of earth over it, and around the sides, to keep in the volatile gases.

When the dung-pit has been thus emptied, it may again be progressively filled as before, and when it is carted out in any of the spring months, it will be found necessary to turn it once, or oftener, for the purpose of accelerating the decomposition of the strawy part of the mass. * * * *

In some parts of Yorkshire the farmers make their cattle eat a great part of the straw, and in Norfolk they convert nearly the whole of the straw into manure, by treading and laying it out to rot. No system is considered so impoverishing to the land, in the latter county, as that of giving straw for food. instead of applying it as manure. A medium course is doubtless the most approved, when it can be conveniently carried into effect. Cattle getting straw for both food and litter, will consume nearly three-fifths of it as food, and there will still remain a sufficient quantity to mix for manure; but if fed wholly on straw, although a large dung-hill may be produced, it will be found of less value.

When cattle get a proportion of turnips, and eat half of the straw, leaving the other half as litter, the manure will be pretty good. If they are in the course of being fattened upon turnips, or other food producing lax-dung and much urine, they will require three-fifths of the straw for litter, and these proportions will produce good manure. Ferns, thistles, ragweeds and other rank growing plants, before coming into seed, by being mixed in the dung-hill, will make a good augmentation to it.

We have been led to recommend the formation of dung-pits on the plan stated, both from a general conviction of their adaptation to the required purpose, and the examination of one constructed on the premises of an eminent agriculturist, the late Mr. Johnstone of Hillhouse, a few miles west from Edinburgh. Mr. Johnstone at one period had eighty cows, and the quantity of urine produced by them presented strong inducements for him to collect and apply it in the most economic method possible. He therefore dug out a dung-pit at a much lower level than the cow-houses, and the bottom of it was paved with stones. The plan pursued is to lay a good depth of earth, or more generally moss, in the bottom; at the mouth from which the carts take away the manure, a large quantity of earth is also laid, so that it may retain the fluid running towards the corner part of the pit. All the dung of the premises is regularly spread in the pit, and the urine, with other liquid refuse, is conducted in wooden pipes direct to the pit, by which none escapes in gutters. Besides, there is a large reservoir to receive the overplus liquid, when the dung and earth in the pit have been sufficiently saturated. Nothing, in fact, is allowed to be lost. When the dung is carted to the fields to form heaps for future use, it is there treated in a corresponding style of economy, on purpose to retain the moisture and fertilizing gases.

As straw is the basis of farm-yard dung, care should be taken to have it cut as close to the ground as possible; for it is evident that a few inches more of straw will ultimately increase the size of the dung-heap. It is calculated that for every ton of straw, three tons of farm-yard dung may be obtained, if properly managed. The weight of straw per acre runs from one to one and a half tons; and on an average of the different crops, about four tons of dung may be obtained from this. An acre of good turnips, with an adequate proportion of straw, is calculated to make upwards of sixteen cart-loads of dung; ten cart-loads, however, may be taken as a large average for these crops Thus it may be presumed that two acres will manure one, and the land, without assuming any very great degree of fertility, should yield at least four tons of manure per acre. If due care be taken to add to this gatherings from the roads, and from refuse of every kind, the amount should be nearly sufficient for a full supply of manure once during every course of the four years' system of agriculture.

In applying manure, particular attention should be paid to free the land from weeds and stones, and properly to pulverize it; for it is only when in this state that manure will mix well with the earth. The time for manuring most common is at the conclusion of fallowing, or before the sowing of the fallow crops. If the land is manured alone from the produce of the farm, ten or twelve tons per acre will be the most that can be allowed, if the management be a regular course of white and green crops. It will be found more advantageous to apply manure in smaller quantities at short intervals, than in larger quantities at long intervals. At whatever time the dung is applied, it should in the first place be scattered evenly over the land, and ploughed in as speedily as possible. Every instant in which it lies exposed to the air, it is losing its value.

LIQUID MANURE.

The value of the urine of cattle, as a manure, has been long known to the farmers in Belgium, who, by the proper management of this article alone, are able, with their inferior means and mechanism, to compete with some of the best of our farming establishments. Thirty years ago, (now forty,) the use of cattle urine was only beginning to be made known in this country. One of the earliest discoverers in this branch of rural economy was Mr. Charles Alexander, a farmer near Peebles, who descibes his plan in a letter addressed to Sir John Sinclair in 1812, and which was published in the Farmer's Magazine. This intelligent agriculturist had been long impressed with the great importance of the urine of cattle as a fertilizer of the ground; and he set about to discover, by a well-conducted series of experiments, the best method of collecting and applying it.

He began by digging a pit contiguous to the feeding stall, but distinctly altogether from that which was appropriated for the reception of the dung. The dimensions of this pit were thirty-six feet square, and four feet deep, surrounded on all sides by a wall; and the solid contents were a 192 yards. Having selected the nearest spot where he could find loamy earth, and this he always took from the surface of some field under cultivation, he proceeded to fill it; and found, that with three men and two horses, he could easily accomplish twenty-eight cubic yards per day; and the whole expense of transporting the earth did not exceed £4, 16s. When the work was complete, he leveled the surface of the heap in a line with the mouth of the sewer, which conducted the urine from the interior of the building, on purpose that it might saturate the whole from top to bottom. The quantity conveyed to it, he estimates at about 800 gallons. The urine was supplied by fourteen cattle, weighing about thirty-four stones each, and kept there for five months on fodder and turnips. The contents of the pit produced 288 loads, allowing two cubic yards to be taken out in three carts; and he spread forty of these on each acre, so that this urine in five months, and from fourteen cattle, produced a compost sufficient for the fertilization of seven acres of land. He states further, that he had tried this experiment for ten years, and had indiscriminately used in the same field either the rotted cow-dung or the saturated earth, and in all the stages of the crop he had never been able to discover any perceptible difference. But what is still more surprising, he found that his compost lasted in its effects as many years as his best putrescent manures.

Since the period of these experiments, a better knowledge of composting from urine has prevailed. It is now well known that in all cases, moss, earth, peat, or any vegetable substance, is better than mere earth. If earth alone be employed, the process amounts to little less than a saturation, and nearly the same end could be gained by throwing rank urine upon the fields. If moss or any vegetable matter be employed, then the urine acting on the fibrous mass promotes fermentation and decomposition, and thus an additional value is given to the product. Mud dragged from the bottom of bogs or ditches, and replete with aquatic plants, or any other vegetable material, is therefore preferable to simple earth.

In the Flemish farm establishments, in which all the cattle are kept constantly within doors and stall-fed, the urine is collected into subterranean vaults of brickwork. These receptacles correspond in size with the extent of the farm and live stock, but in general they are about forty feet long, fourteen wide, and seven or eight deep. One aperture is left through which the urine and other ingredients are received, and another to pump it up by. As age and fermentation are found to add considerably to the efficacy of this manure, the best constructed cisterns are divided by a partition, with a valve to admit the contents of the first space into the second, where it remains till ready for use. The smallest of these cisterns will hold a thousand barrels of thirty-eight gallons each, and in that quantity, from two to four thousand cakes of rape seed, weighing two pounds each, will be mixed, and frequently the matter from the common-sewers of the adjoining towns is added. The soil to which it is chiefly applied is that on which flax is grown, and the usual allowance is 2480 gallons, beer measure, to the English acre. It is stated that twenty-one acres upon a farm of 200, are abundantly manured for crops of flax and rape with the manure of forty-four head of cattle. So partial are the Flemings to liquid manure, that frequently after the farm-yard dung is fermented, they throw water upon it, and the washings of the manure are alone carried to the field. The earth immediately imbibes the liquid, which soon reaches the roots of the plants, and causes a rapid fermentation; whereas dung, in a solid state, is comparatively a long time before it fertilizes the soil. The straw, and other matter which remains after the dung is washed, is applied as manure for potatoes.

We do not by any means recommend the dissolution of dung in water, according to the last-mentioned plan of the Flemish farmers; but any method by which the liquid manure can be saved, receives our unqualified approbation.

Cattle fed upon common white turnips will each yield about two-thirds of the weight of the turnips in urine, or about a gallon for every twelve pounds; and it has been calculated, in Scotland, that the urine of six cows will enrich a quantity of land sufficient to top-dress an English acre of grass land. It has also been proved by experiment, that the quantity of urine passed by a moderate-sized person amounts to about half a gallon per day, which, by the Flemish mode of application, would be sufficient to manure half a rood of ground every year. Urine of every kind, when properly diluted with water, forms a food highly nourishing to plants. Sir Humphry Davy conceived that "it contains the essential elements of vegetables in a state of solution." His opinion, however, regarding the state in which it should be applied, is not in accordance with the practice of either China or Flanders, or of Mr. Johnstone of Hillhouse. Sir Humphry Davy says—"During the putrefaction of urine, the greatest part of the soluble animal matter which it contains is destroyed, consequently it should be used as fresh as possible." He again adds, "Though less active than fresh urine, it is a powerful manure." We were personally informed by Mr. Johnstone of Hillhouse, that from the circumstance of a considerable quantity of water flowing into his reservoir during rain, he considered the fermentation of it was necessary to increase the strength of the water and urine combined. In the advantage of mixing the urine with water, Sir Humphry Davy agrees; he says, "It should be diluted with water before being applied; because it contains too large a quantity of animal matter to form a fluid nourishment for absorption by the roots of plants."

Many farmers urge, as an apology for their negligence in not collecting fluid manure, that the washings of the farm-steading and dung-hill, though of a brown colour, are often so diluted with water as to be useless, and that carrying the water away from the dung-hill impoverishes it. The practice of Mr. Johnstone of Hillhouse was a direct reply to these objections. He allowed the urine of his live stock to flow over the dung, and to saturate the earth in front of it; and when this was effected, it escaped into the reservoir. The dung he applied to potatoes and turnips, and the liquid manure for the most part to clover grass. In one experiment, after a naked summer fallow, he reaped ten bolls of wheat per acre by it, the liquid being applied immediately before the sowing of the seed. He likewise tried it on oats and barley with considerable success; but the crops on which it acts most powerfully are clover and rye-grass.

Mr. Johnstone applied the manure at the rate of about 2400 gallons to the acre, being nearly the same as in Flanders; but from the want of rape cake, it is not so rich as the liquid manure of that country. In our presence he made his mower cut a swathe across an unwatered ridge of clover and rye-grass, and another corresponding swathe across the watered ridge immedietely beside it, neither of the ridges being by any means at maturity. The swathe on the unwatered ridge weighed twenty pounds, and the swathe on the watered ridge weighed thirty-seven pounds, or nearly double. The succeeding crops, in the rotation of oats and turnips, have also when reaped, a most marked distinction as to strength and quality. He tried liquid manure upon young grass occasionally, from after harvest to April, but uniformly found the month of February, the best period for its application.

On a farm lately rented by Mr. Johnstone, belonging to Lord Meadowbank, the crops upon it, by the application of saturated earth and liquid manure alone, for some years previous to the expiration of his lease, were not surpassed by any in the neighbourhood. His successor, manuring his ground with dung alone, found his crops very deficient, and attributed their failure to the scourging effects which the saturated earth and liquid manure applied by Mr. Johnstone had ultimately upon the soil. But suppose turnips to be manured with saturated earth, only one crop intervenes between it and the application of liquid manure to young grass, which, as stated above, had a most beneficial effect. Now, it is a well known fact, that when a crop of clover is strong, the succeeding crop of oats will have a proportionate degree of strength. As only one crop intervenes between the application of saturated earth and urine, it is evident that this must produce a more fertilizing effect than only one application of putrescent dung to four crops. These are considerations worthy the attention of every individual whose interests are connected with the cultivation of the soil. There are many farmers in the neighbourhood of Edinburgh, where plenty of cow's urine is to be got at little expense, who now find it their interest to apply it to their young seedling grass in spring.

Liquid manure is no less valuable for the garden than the field. Sir George Staunton states, that the Chinese apply liquid manure to their fruit-trees, as contributing much to their growth and vigour. In many cities of that empire, it is sold in the streets for the purposes of garden culture, in quantities so small as an English pint. Columella relates, that in his time, "liquid manure had much improved the apples and vines of Italy." Its effects are highly beneficial to gooseberries and strawberries, when applied immediately before the breaking of the bud in spring. It makes potatoes, whether early or late, both large in size and very productive; the most efficacious time of applying it being in the drills, immediately before or after the brairding of the plants. The young shoots rapidly imbibe the nourishment, making the stems and tubers very luxuriant. They require no other manure; and a slight application is only necessary in the culture of the drills. To the cabbage and colewort tribe, it is equally valuable. We would impress on every cultivator of the soil, that it is for his own interest to collect this valuable liquid by every possible means; and as he has the experience of other countries to guide him, he need have no fears in applying it. There is no farmer but must have occasion to keep up the fertility of his land by the application of lime, bone-dust, rape-cake, and other ingredients, and a great part of this expense may be saved by collecting and applying what is absolutely wasting in his farm-steading.

NIGHT SOIL.

Such are the fertilizing effects of this manure, that it has been assumed the excrements of a man, when properly applied, can be made to produce sufficient corn and roots for his own support. This assertion is no doubt exaggerated, but the nourishment afforded by this manure is very great, and especially evident in the production of potatoes. From the fetidness of its smell, it is commonly allowed to become decomposed before being used, and vast quantities are carried off from large towns by sewers, and lost in the sea. It has been said that night soil communicates an unpleasant flavour to plants; but this objection can easily be removed, by mixing it properly with ashes or lime before being applied to the soil. In China, from the denseness of the population and from the labour being principally manual, it is the only manure in use, both for the garden and fields.

The night soil of Paris is now manufactured into cakes with a mixture of lime and ashes, and exported to Flanders and the Low Countries, where, after being converted into liquid manure, it is extensively used. It is particularly valuable as a top-dressing for grass lands. An instance of this is mentioned in the Norfolk Report, of a field newly laid down to grass, every part of which proved poor, except two acres on which four wagon-loads of night soil had been spread. The effect of the night soil was so great, that while the rest of the field was thinly covered, the grass on this part thickened and grew luxuriantly, and even in autumn had a fresh appearance. In Essex it is used mixed with five times the quantity of fresh earth. In applying it to potatoes and turnips, but a small quantity should be used, otherwise the plants will be apt to run too much to stem and leaves. When plowed alone with a shallow furrow into soil, the grain has been known to run directly to straw, its immediate effects are so violent; but this does not continue beyond the first year. Night soil is sold in London at fifteen shillings a wagon-load of ninety bushels.

ASHES.

Coal ashes and cinders have little fertilizing effects in themselves; but being obtained principally from large towns, they are mixed with night soil and vegetable and animal refuse, and thus make valuable manure, especially for turnips. In cold poor clay soils, their effect is very stimulating, producing fine crops of wheat, barley, oats, and grass, but they are inferior as a manure for potatoes. The ashes of turf and timber, mixed in the same manner with animal and vegetable refuse, have nearly the same effects as the ashes of earth and peat, which we will allude to when treating of paring and burning. In the Low Countries and in England, the ashes of peat are used extensively, and with good effect, as a top-dressing for clover. The ashes in the highest repute in England are those made at Newbury in Berkshire. From the saline matter contained in the Dutch ashes, and the washings of chalk in those of England, they may be said to be rather mineral than vegetable manures.

Soot is a refuse of different kinds of fuel, and its strength is in proportion to the quality of the materials from which it is produced. It is used extensively around Edinburgh as a top-dressing for seedling grasses, being sown by a machine made for the purpose. Rye-grass is supposed to reap a greater benefit from its application than clover. The soils on which it has the most efficacious effect are said to be light gravel, limestone, and chalk, and it has been proved in Mid-Lothian to be of great use on cold clay soils sown with grass. It is sometimes sown with wheat and oats, to prevent the ravages of the wire-worm; and upon turnips, immediately after the brairding of the plants, it has had very beneficial effects. We have seen it applied on a field of potatoes, which had become sickly and yellow in colour, but with little apparent good. Soot may assist the crops amongst which it is more immediately applied, but its benefits will extend very little beyond the first year.

BONE-DUST.

Bones, which have now become a very important manure, are composed of earthy salts, chiefly phosphate of lime, with a little carbonate of lime, phosphate of magnesia, and about one-half of decomposable animal matter. Those of fat young animals are allowed to be the best.* They are less beneficial for clay lands than light soils, and less efficacious in wet than in dry seasons. In the improved districts of Scotland, bone-dust is coming into very general use as a manure for turnips, and mills for crushing bones are general in many parts of the country. There has been no improvement in Scottish agriculture so universally adopted as that of applying bone-dust to land intended for the production of turnips, and it seems better qualified than any manure hitherto tried for bringing waste land into cultivation. It is light and can be carted to a great distance at little expense, one wagon load of 100 bushels being found nearly equal to 40 cart-loads of farm-yard manure. It is asserted by some, that its efficacy remains during the whole rotation, and even after it. On pastoral farms it will be found exceedingly useful; as, raising a better crop of turnips, it will greatly improve the condition of the stock.

In corroboration of the above remarks, we quote the following:

"A farmer obtained a forty years' lease of a tract of poor land in a high situation near Rockdale in Lancashire, on which, after fencing and draining, he erected a bone-mill, and began manuring the land at the rate of from 100 to 130 bushels per acre. The consequence of this was, that he let off, in a few years, more land than paid the rent of the whole, and retained a large farm in his own hand."†

In the wolds of York and Lincoln shires, it is stated that "before bones were extensively used in turnip husbandry, many

* The following table gives the ordinary proportions of the ingredients composing bone-dust:—

Earthy and saline matter,	40	parts in 100.
Cartilage and jelly,	40	
Fatty matter,	20	

† Journal of Agriculture.

thousands of acres were annually sown for that crop without any manure whatever. Turnips upon such unmanured land were consequently very indifferent, and the benefit of feeding sheep on their tops was very trifling. But since the use of bones has become general, the turnip crop has increased tenfold. All the succeeding grain crops have been much larger, and upon the four or five shift system, there is no doubt the land will go on progressively improving, requiring a less quantity of bones annually, from its increased fertility and power.*

From experiments made regarding the efficacy of bone-dust contrasted with farmyard dung, on soils of a light sandy nature, the result has been uniformly in favour of the first, one and a half tons of bones being equal to twenty tons of dung. To ascertain the effects of large and small quantities, from 20 to 100 bushels per acre, in various amounts, have been applied, and it has been found that the crops are not increased when laid on beyond a certain quantity. By being applied in large quantities, although not immediately beneficial, bone-dust has been found to render land extraordinarily productive for a great length of time. We quote the following rules for its application:

"1. On dry lands, limestone, chalk, light loams, and peat, bones are highly valuable manure. 2. That they may be applied to grass with great good effect. 3. That on arable lands, they may be laid on fallow for turnips, or used for any other subsequent crops. 4. That the best method of using them when broad-cast, is previously to mix them up in compost with earth, and let them lie and ferment. 5. That, if used alone, they may be either drilled with the seed or sown broad-cast. 6. That bones which have undergone the process of fermentation, are decidedly superior in their immediate effects to those which have not been fermented. 7. That the quantity should be about twenty bushels of dust, or forty of large bones, increasing the quantity if the land be impoverished. 8. That upon clays and heavy loams, it does not yet appear that bones will answer. On this latter observation, however, a farmer near Nantswich in Cheshire remarks, that he "occupies a farm in the township of Pickmore, the soil of which is a clay loam scarcely twelve inches deep, the subsoil a gray sand mixed with coarse clay, on a bed of good clay marl. Two years ago he covered a field with bone manure, previous to which the grass was so sour as not to be worth ten shillings an acre; but it is now full of most excellent herbage, consisting of white clover and trefoil.' To this he adds, 'that on another of his fields with a clay soil, a small portion of it was manured thirty-two years ago by a former tenant with bones, and that although it has been twenty years in tillage, yet that part still shows a superiority over the rest.' At Clumber Park, the seat of the Duke of Newcastle, 600 bushels of small bones were in 1822 spread upon 24 acres of grass land in the dairy farm, consisting of dry, sandy, and gravelly soil, which had been laid down about ten years. Their effect upon the pasture improved the condition of the cows so materially, that about twice the quantity of butter was made from them as from cows grazed on land of a similar quality, but not boned; and this effect, it is said, still continues. The time for laying them upon the land as a top-dressing to grass, whether seedling or pasture, is generally recomended to be early in spring. Seeing that the fertilizing quality of bones is improved by fermentation, it has led to the supposition that they may be usefully applied in compost with earth and other substances; by this mixture it has been found from experiment that they soon become decayed and pulverized. It is stated in the Doncaster Report, 'that this method of using bones in the formation of composts is recommended by several intelligent farmers, thirteen of whom, solely from their own experience, describe its effects as superior to those of bones used singly. With some of these, it is the practice to mix fifty bushels of bones with five loads of burnt clay, or good earth per acre, by which dressing, the crops between fallow and fallow, except clover, appear to be increased one-fifth in value.'"*

Taking into consideration the great and increasing demand for bone as a manure, and the immense quantity of land under cultivation by it, it may be expected that the demand will soon exceed the supply. This, however, will only be for a limited

* British Husbandry.

* British Husbandry.

period; for if the demand continues, it may be anticipated that the importation of bones from South America, Africa, Australia, and many Asiatic countries, will yet form an important branch of commerce. By the application of bone dust, large quantities of waste land may be brought into use for dairy husbandry, and the cultivation of grain in consequence will be increased.

Among the substances which can be applied as manure, the following may be enumerated:—Hair, horn, woollen rags, oil and rape cake dust, sea-ware, kelp, refuse fish, blubber, train oil, &c. But, as well remarked by Professor Low, "it is not necessary to specify all the substances which can be applied as manures. The law is of general application, that all animal and vegetable substances can be used for this purpose; and the province of the farmer, therefore, is carefully to collect every substance of nature which comes within his reach, and if it does not of beneficial application in its separate state, to form it into a compost, or mingle it with the general mass collected in the farm-yard."

In concluding these notices of the various kinds of putrescent and nourishing manures, it is necessary to explain, that there is a limit beyond which manuring would be more hurtful than beneficial to land, at least as respects grain crops. If the fields be over-saturated with the rich juices of manure, the grain crop is apt to be injured, in much the same manner as a human being contracts disease by over-luxurious feeding. The crop being apparently unable to secrete the juices placed in the land for its use, it becomes affected with parasitical fungi, which develope themselves in the blades of the plant, and ultimately destroy the vegetation. This is observable in the case of *rust* in wheat, a disease arising, as is believed, from an over-fertile state of the soil. We shall afterwards give this subject the attention it deserves, in our section, on the Diseases of Crops; and, meanwhile, content ourselves with recommending, that manure should not be applied either in a too lavish or niggardly manner, but to that extent which will put the land in good heart, or in a properly balanced condition.

SALINE MANURES.

Common sea salt, when judiciously administered in moderate quantities on arable land, at the time of fallowing, has been found of great value for its manuring and cleaning properties. It promotes fertility, is a remedy against smut, preserves the seed from vermin, and is particularly useful in increasing the produce of grass crops. It is understood to act as a stimulus to vegetation, by enabling the roots of plants to take up more nutriment in a given space of time, and to perform their secretions and depositions with increased energy. From twenty to thirty bushels of salt are sufficient to sow per acre on fallow land, and to incorporate with the soil during subsequent processes of plowing and harrowing. In some instances, pasture and barley tilths are greatly improved by scattering upon them from twelve to sixteen bushels per acre; this will, at least, most effectually destroy all snails, slugs, and eggs of insects, on the land.

Lately, saltpetre and nitrate of soda have been warmly recommended as fertilizing and cleansing manures. On this subject we beg to subjoin the following extract from the letter of a correspondent in the Farmers' Magazine, dated February, 1840:

"Some time since, inquiries were made by some of your correspondents relative to the use of saline manures; those inquiries have not been replied to in a way likely to be satisfactory to the parties requesting information. I am induced in consequence, though not accustomed to such public exhibition, to offer a few plain remarks for insertion in your very useful Magazine, if you think them worthy of a place therein; the only recommendation in my power to give them is, that they are the results of ten years' experience of a plain practical farmer.

"Ten years ago I purchased fourteen pounds of saltpetre, and applied it to two stitches, or warps, (as we call them in Kent,) of corn, one of wheat and the other of oats; in about ten days, the effect produced was distinctly visible in the deeper green colour of the corn, and in a month, if the situation of the fields would have admitted it, the two warps might have been easily distinguished at the distance of a mile; at harvest the corn was about a foot higher than the adjoining warp, on which no petre was put. This was done about the first of May; the petre was sown on the corn, and nothing more done to it; the land a stiff, heavy, close soil. The following year I purchased a ton, and applied it to wheat in the month of April, putting it on one warp and omitting one in several fields of similar soil to that mentioned above, and the result was equally favourable. The next year I purchased several tons, and among other experiments applied it to one warp of wheat, being about the sixth part of an acre, doing nothing to the other part of the field; the warp with the petre was reaped by itself, and the adjoining one, without petre, was also reaped by itself; both were carted and thrashed separately. The warp with petre yielded six and a half gallons of wheat and four trusses of straw more than the other, the soil as before, and the quantity of peter used one hundred weight per acre, sown on, and nothing more done to it afterwards; the other land on which the petre was put appeared equally benefitted.

"I have continued to use saltpetre from the above time to the present, increasing my purchases: last year, 1839, I bought about twenty tons, which was put on nearly 300 acres of wheat, being about three-fourths of my whole growth, and I have no reason to regret the outlay. I have not used nitrate of soda before last year, when I purchased one ton, and put it on the poorest field then in wheat, on which no manure had been previously put, containing twelve acres, sowing with it one warp in two, at a cost of 57s. per acre; on the other warp was put saltpetre, amounting to the same sum per acre; the result was a fine piece of wheat, but the warp with nitrate of soda was decidedly the best.

"I have now, sir, thus far given you my doings with petre, &c., and will now endeavour to answer such questions as would probably suggest themselves to me, supposing myself the inquirer; in doing which it will not be necessary to travel through all that has led to the conclusion arrived at: having no object but the public good, you may rely nothing shall be offered intentionally wrong."

The following practical observations and directions are added:

"I have used from half a hundred-weight to two hundred-weight per acre. The intelligent farmer will readily determine, from the state of his field, the appearance of his crop, &c., the best quantity to put on, not exceeding the greatest mentioned.

"As soon after the 25th of March as the land is dry enough to bear a horse well, and when the weather is fine, and has been so for a few days, as long after and as soon before a shower as may be, is best; it may be applied for a month after the above time with success.

"It should be sown like corn. Late experience induces me to say, lightly harrow the land after sowing, if wheat, if oats, dispense with the harrowing; in either case, leave it rolled down. If it is desirable to sow clover, or any other artificial grasses, it may be done at the same time the petre is sowed, and both harrowed in together; the small seeds will be assisted by the petre in getting out of the way of the fly.

"Wheat will most likely yield the best profit, for this obvious reason, a slight improvement in that crop amounts to the greatest sum, other corn not being so valuable. It is particularly useful to wheat that has expended itself during a mild growing winter; such wheat seldom goes on well without some assistance; gets bunchy, and generally much scattered. The application of petre will in most cases prevent the above and carry it through; in this case a large quantity is necessary, but should not be applied until the first symptoms of declining present themselves in the wheat.

"Oats are much resisted by the application of petre, and will, through increase of crops, pay for doing, next to wheat.

"Barley, (I grow but little,) as far as my experience will enable me to say, it does less good to than to oats.

"Beans, in my land, receive but very little benefit from petre.

"Peas—The same results as beans.

"Tares, in some instances, have been much benefitted, in others but little; cannot recommend turnips; never saw it applied to them.

"Clover—The increase of crops not sufficient to repay the outlay.

"Grass land or meadow—The same remark as above.

"Nitrate of soda may be sown in the same way as rough petre. From observation, and one year's experience, I should think nitrate of soda will answer every purpose of rough peter, at less than three-fourths of the expense—my purchases of soda will consequently be greater this year than last."

For the Southern Planter.

Apples.

WINCHESTER, Va., Aug. 11th, 1859.

MR. EDITOR:

Permit me to correct an error of friend Taylor's, (in June No.) respecting my Apple. I am well acquainted with the Ross Green. There are some old trees in my neighbourhood of this fruit, but nurserymen have ceased to propagate it. My Apple is not the Ross Green, but decidedly a superior fruit in every respect. The original tree is standing upon the farm of Mr. John Hott, about eight miles north of Winchester. As friend Taylor concedes the right to me to name the Apple, I had some idea of calling it the "Hottentot," but feared the compliment would appear equivocal; but "what's in a name?—an Apple by any other would *eat* as sweet." And from the extraordinary keeping qualities of this Apple, if it is not precisely the same variety that Sir Isaac made all his calculations by, I have strong reason to believe it identically the same that Dido found the bee in, because I have noticed that bees, wasps, and hornets are "dre-ful" upon them.

Yours respectfully,

H. M. BAKER.

An Atmospheric Dryer.

A substance capable of drying the walls and the atmosphere of damp houses is important and valuable. Such a substance is the chloride of calcium. It is a salt which has such an affinity for moisture, that it attracts no less than 124 parts of water for every 100 parts of itself, from the atmosphere or other sources. It will even dry damp clothes if placed near them in a room, and will remove the sweat from damp walls of buildings. As damp houses are generally unhealthy, causing chills and fevers and rheumatism, it is a most useful substance, we believe, for the remedy of such evils. If placed in sheet-iron pans in close proximity to damp walls, it soon becomes saturated with the moisture, and, as a consequence, the walls soon become dry. A moderately dry atmosphere is undoubtedly the best preservative, in cold weather, against sudden chills, and it is well known that a damp atmosphere feels more chilly than a dry one, even when the latter is several degrees lower in temperature. It is also very dangerous for any one, and especially a person predisposed to lung diseases, to sleep in a damp apartment. Now, to remedy the difficulty, take one pound of dry chloride of calcium, spread it upon an iron pan, and it will soon absorb the moisture, and render the room safe and comfortable. In many cases it may thus be employed as an excellent sanatory agent, and it is for this reason we direct public attention to it. It may also be used over and over again by driving off the water which it absorbs, by heating the iron pan containing it over a fire.

Scientific American.

Carats Fine.

The term *carat* or *karat*, originally designated an Abysinian bean. Being very uniform in size, and undergoing scarcely any loss by drying, they came to be used as the standard of weight in Africa for gold, and in India for diamonds. Each carat was divided into 4 grains, of which 74 are nearly equal to 72 grains troy. This system of carats and grains is still used in the valuation of diamonds. But in the case of gold, the term *carat* implies, not so much any actual weight, as a fractional division, of which 24 go to make a unit. *Twenty-four carats fine* expresses the unity of pure gold, and signifies, not the specific weight of any given mass, but only that, in the 24 imaginary parts into which it may be supposed to be divided, there is no alloy.

The gold assayer takes his unit or *integer* 6 or 12 grains troy. This small quantity is most convenient for purposes of assay, and these particular numbers are used for convenience of calculation. This 6 or 12 grains is called, by the English assayer, an *assay pound*, and is, by him, divided into 24 carats, and each carat again into quarters and sixteenths. The assayer of silver takes 18 to 36 grains troy for his assay pound, and divides it into 12 ounces, each ounce into 12 pennyweights, and these again into half pennyweights—making, for the silver assay pound, 480 divisions or *reports*. On the continent of Europe the division of the assay pound for gold is different from the English.

In the English mint, the term carat expresses no given weight, but merely degrees of fineness, of which 24 indicates purity.

The carat is sub-divided into quarters, and these again into eights, making to each carat 32 parts, 768 of which represent pure gold.

These varying, complicated and arbitrary systems are the relict of an age which delighted in intricate and perplexing mysteries. They are gradually yielding before the scientific demand for uniform and universal formulæ. Instead of each trade having its own peculiar weights and measures, there must come to be one standard for all business, and ultimately one for all the leading nations of the earth. Instead of one measure for cloth, another for length, and a third for land; one measure for wine, another for beer, and another for grain; one weight for the apothecary, and another for the grocer; one standard for France, a second for England, and a third for America, there will be one uniform standard for all, based upon the *decimal* system.

Richmond Dispatch.

Benefit of Drought on the Soil.

A drought acts upon the moisture in the earth as follows: During dry weather, a continual evaporation takes place from the surface soil, above that supplied by rain and dew, which creates a vacuum (so far as the water in the surface soil is concerned,) that is at once filled by water rising from the subsoil—extending deeper and deeper as the drought continues and the moisture is exhaled—a circulation of water in the earth the reverse of that which takes place in wet weather. This progress to the surface of the water in the earth, manifests itself strikingly in the drying up of springs and wells, and streams which are supported by springs.

Not only is water thus brought to the surface of the earth, but also all that the water holds in solution. There are salts of lime and magnesia, of potash and soda, or indeed whatever the subsoil or top strata of the earth may contain. The water on reaching the surface is evaporated, but leaves behind its lime and potash, its phosphates, silicates, carbonates, and salts—all indispensable to the growth of the vegetable products of the farm. Rain water, as it falls, will dissolve but a very small portion of some of those substances; but when it sinks into the earth, it then becomes strongly imbued with carbonic acid from the decomposition of vegetable matter in the soil, and thus acquires the property of readily dissolving minerals on which before it could have little effect.

Several experiments tried by Prof. Higgins, go to show this action of drought in bringing mineral waters from a depth to the surface of the soil. In one case he placed a solution of chloride of barium in the bottom of a glass cylinder, and then filled it with dry soil. After long exposure to the rays of the sun, the surface of the soil was tested with sulphuric acid, and gave a copious precipitate of sulphate of baryta. Chloride of lime, sulphate of soda, and carbonate of potash, were experimented upon in like manner, and upon the application of proper tests, the surface of the soil showed their presence in large quantities, drawn up by the rising of water from underneath, as in the case of drought.

The parched earth—all vegetation dwarfed and withered by the heat—seems suffering under a curse, but it is only an affliction for the present—"a blessing in disguise" for the future. "The early and latter rain," may produce at once abundant crops, but dry weather is needed to bring to the surface from the depths of the earth, where else it would be forever unemployed, food for future harvests. It is Nature's ordinance for keeping up the fertility of the cultivated soil.—*Country Gentleman.*

Plants in Rooms.

In the crowded city, amid its dust, smoke, turmoil and troubles, it is pleasant to find a memento of the country in the opening rose and the modest daisy. When we see a pot of flowers adorning the window of a room, however humble in appearance the domicil may be, the feeling arises spontaneously in the mind that they are fostered by the gentle hand of some one whose tastes are true and tender. A few words on the culture of plants in rooms may be beneficial to many persons at this particular season of the year. They should be placed in a situation where they can receive an abundance of light and air; otherwise they will become sickly. Exposure to the dews at night (where this can safely be done in cities,) then taking them in next morning, greatly promotes their health.

Plants are frequently injured by injudicious watering. Some persons seem to suppose that deluges of water afford a sure remedy for all the evils to which plants are subject. This is a mistake. True, they require a considerable amount of moisture, but not one half the quantity which is oftentimes applied. Evening is the best time to water them, and in every case, cold water from a cistern or a pump should be avoided. The water should be warmed by exposure to the sun, or in some other manner, up to the temperature of the atmosphere before it is used. Many plants are greatly retarded in their growth by cold water being poured upon them. The quantity to be applied varies with the size and nature of the flower; the ground should be thoroughly moistened, but not soaked. If the leaves should become infested with insects, some tobacco juice, mixed with water and sprinkled over them, will soon destroy these. The great feature in cultivating plants, to promote their health, is that which is equally efficacious with human beings—cleanliness.—*Scien. Amer.*

Value of Scientific Instruction to Farmers.

No mistake is more common than to suppose that science means scholastic puppyism. Every practical farmer who understands cause as well as effect, is a scientific farmer. Indeed, every man, whatever may be his calling, who understands what he performs, and does not blindly follow mere empirical recipe, is a scientific man; while those who do not, are simple quacks. A mere farm-laborer, who works like a machine, obeying orders, is valuable as a laborer; but it is a great error to call such an one a practical farmer, simply because he can handle a tool and show warts on his hands. Science means knowledge reduced to a system so as to be easily taught and readily understood; and any farmer, whatever may be his expertness as a plowman, who cannot tell why he plows, except by answering, that crops grow better from such practice, makes a mistake when he calls himself a practical farmer. He should understand so much of nature's laws as to avail of them most profitably; and those who speak of errors in the application of chemistry or natural philosophy to farming, as science, do not know the meaning of the term.

By referring to our definition, it will readily be seen that no such thing as a scientific error can exist. It is the absence of science that causes errors, and not its practice. If nature's laws were clearly understood, what farm would be without under-drains? What field would be manured with inappropriate substances not deficient in the soil, and not required by the crops? Who would believe that redundant amounts of ammonia were more valuable than inorganic constituents in a proper state of progression, such as are found in the ashes of every plant? Who would repudiate the subsoil plow or an under-drain? Who knows that under-drained soils never suffer from drouth, and that sub-soiled meadows never run out, and who clearly understands the causes why these *two* facts always prevail?—*Working Farmer.*

The Old "Red Cent."

As the "old red cent" is about being called in some of our cotemporaries are writing its history and obituary. The cent was proposed in 1782, by Robert Morris, the great financier of the revolution, and was named by Jefferson two years later. It began to make its appearance from the mint about 1792. It bore then the head of Washington on one side, and thirteen links on the other. The French revolution soon after created a rage for French ideas in America, which put on the cent, in tead of the head of Washington the head of the Goddess of Liberty—a French Liberty—with neck thrust forward, and flowing locks. The chain on the reverse was replaced by the olive wreath of peace. But the French Liberty was short-lived, and so was her portrait on our cent. The present staid, classic dame, with a fillet around her hair, came into fashion about thirty or forty years ago, and her finely chiseled Grecian features have been but slightly altered by the lapse of time.

A Farmer's Story.

At the Woodbury plowing match, a few days ago, Mr. John Daw told the following anecdote:—Having drained a field where nothing had ever grown before, I was standing near looking at a crop I had there, when a neighboring farmer came up and said to me, "That is a bootiful crop! how did ee get it, sur?" I replied, "Brains." (Laughter.)—"Wat! manure the field wi' brains?" (More laughter.) The fact was, I had drained the field; so I said, "Yes." (Renewed laughter.) He replied, "Lord, your honor, where did ee get um?" (Roars of laughter).—

Shelbourne (Eng.) Journal.

Plaster or Gypsum.

The precise manner in which it acts upon plants has never been accurately ascertained. It is quite probable, nevertheless, that it enters into a reciprocal but rather slow action with the humus contained in the soil to which it is applied, and this latter substance decomposes the acid of the gypsum, and forms carbonic acid, or, perhaps, some more compound substance. On this subject a late writer remarks: "It is not as yet known what is the nature of the matter thus formed, and, in all probability, never will be, on account of the rapidity with which it decomposes. It is probable that the sulphur, thus deprived of oxygen, blends with the lime, and with a portion of the hydrogenated carbonic; and that this combination produces the fetid odor which is disengaged when the gypsum is combined with substances in a state of putrefaction. From all appearances we are led to believe that this carbonic acid and its new combinations are peculiarly adapted for the nourishment of certain plants. Hence it happens that the effect of gypsum is proportionate to the quantity of humus contained in the soil over which it is spread. To the practical agriculturist, it is of comparatively little consequence how gypsum acts, so long as its application is known to produce certain beneficial results on specific crops. Many of the hypotheses, presented in explication, are doubtless erroneous. Dr. Franklin and Judge Peters were early advocates for the use of plaster, but it was a long time before they succeeded in convincing the farmers of Pennsylvania of its utility. This was effected in the following manner. A quantity of finely pulverized plaster was taken by Franklin to a side hill, in the vicinity of Philadelphia, and there applied on a field carpeted with young grass, in such a manner as to distinctly represent the letters composing the words, 'THIS HAS BEEN PLASTERED.'"

The effect was very soon apparent, the superior vigor and luxuriance of the grass where the plaster had been applied rendering the sentence traced on the field distinctly legible at the distance of many rods. In compost, gypsum is of great value. Its affinity for ammonia renders it a powerful fixer of that product of putrefaction, and is one of the most valuable articles that can be used to obviate the losses consequent upon the excessive fermentation of stable and other putrescent manures in the spring The composition of gypsum, according to Buckhottz, is thirty-three parts in one hundred of lime, forty-three of sulphuric acid, and twenty-four of water of crystallization. It requires four hundred and sixty-one and a half parts of water to dissolve one part of gypsum; but it may here be remarked that the data relative to this point vary considerably, scarcely any two specimens of the mineral giving precisely similar results.

Scientific Artisan.

To Preserve Ice and Always Have Ice Water.

Mr. Editor.—Prepare a double green baze or blanket or flannel bag in the shape of a pudding bag. It may be lined inside, to keep the fuz out of the water, with a layer of muslin, and covered outside with any material for show. Put a sufficient quantity of ice in a pitcher of water and cover it with this bag; it preserves the ice better than any other mode, and if you use ice enough, you may always have cold water. I have covered my ice water in this way at bed-time, and found ice in the pitcher in the morning.

I got the idea or pattern from an Irish gentleman many years ago, and named the article Paddy's Night Cap. It is better than any patent ice pitcher, and can be made for a mere trifle.

Remarks.—If a small quantity of ice is put into a pitcher of water it melts rapidly, but a large quantity soon reduces the temperature of the water, so that it acts as a preserver of it with a cold medium, and in this way, under "Paddy's Night Cap," it is better preserved than in an ice pitcher.

Philada. North American.

Coffee, its Cost and Culture.

It is believed by many that coffee can be cultivated in some of our Southern States as successfully as in Brazil, Java and Jamaica; if so, it is high time that some of our planters were entering upon its culture, as it costs our country no less than $15,500,000 annually for the beans of this plant.

The coffee-tree lives to a great age, provided that the land is kept well drained. The trees begin to bear when three years old, and is at its full bearing when seven years old. The tree is allowed to grow in height from six to seven feet; the top branches are pruned off when the tree is five years old, so that by the time it is seven it resembles a spread umbrella. Each branch droops downwards, and thus gives the pickers a good chance to pick the berry. The coffee-tree in Brazil bears two crops each year, the large crop in spring, and the small one in the fall. The first crop is picked when the berry is red, resembling a cherry. The second crop is in general small, and allowed to remain on the tree until fully ripe and dry. This crop, cured in the husk, is far superior in quality, and is called "pearl coffee." The blossom is beautiful, small and tender. It remains on the tree from three to four days. If the weather is warm, with showers, during those few days, the crop is sure; if cool at nights, it often fails. When the berry is taken home from the field it is carried to a mill-house. The mill consists of three small rollers. The berry is put into a hopper, and a constant stream of water falls on the rollers during the time the mill is at work. By this process the outside hull is taken off and the berry is separate from it, and the coffee falls into a brick tank, where it is washed perfectly clean, and then put on a place covered with tile or brick raised in the centre, that the water may drain. It is then taken to the curing loft, where it is turned four times a day, until the husk is crisp and dry. Then by putting it through large fanners the inside hull comes off, and leaves the berry ready for hand-picking for market.—*Scientific American.*

Woman in the Garden.

Much in these days is said about the sphere of women. Of this vexed question, we have nothing now to say. The culture of the soil, the body and the soul, are our themes. Rich soils, healthy bodies, pure, cultivated souls, these are what we are aiming at. And to this end we recommend that every country woman have a garden that she keep and dress with her own hand, or at least, that she supervise and manage. The culture of strawberries, raspberries, blackberries, gooseberries, currants and garden vegetables are as delightful and profitable as anything in which woman can engage. She may sprinkle her garden well with flowers. All the better for that. A snowball in this corner, a rose in that, a dahlia bed there, and a moss border here, will not be out of place. Only let the substantial and useful constitute the chief part. A touch of the ornate, like a ribbon on a good bonnet, is not in the least objectionable. In all the schools the girls study botany. In families the women ought to practice botany. It is healthful, pleasing and useful. The principles of horticulture are the principles of botany put into practice. Farmers study agriculture, why should not their wives and daughters study horticulture? If any employment is feminine, it would seem that this is. If any is healthy, this must be. If any is pleasurable, none can be more so than this. A rich bed of strawberries, a bush of blackberries or currants, a border of flowers produced by one's own hand, what can well afford a more rational satisfaction? We say to all our country sisters, have a garden, if it is only a small one, and do your best with it. Plant it with what pleases you best, with a good variety, and see what you can do with it. What woman cannot raise beets, tomatoes, melons, onions, lettuce, and furnish her own table with them? What woman cannot plant a raspberry bush, or currant, or gooseberry, and tend it well? Come, good women, study your health, your usefulness and happiness, and your children's also.—*Valley Farmer.*

Sanitary Precautions.

In the height of summer all persons are especially called upon to look around their dwellings, and consider whether there is not something unfriendly to health that might and ought to be removed without delay. Constant attention is requisite, that nothing offensive be suffered to remain within doors. Liquor in which vegetables have been boiled, soap-suds, dirty water of every kind, should be immediately thrown away; also cabbage-stalks, potato-peeling, and offal of every kind. The liquor in which greens have been boiled, if suffered to remain even a few minutes, or thrown down a scullery drain, emits a most unpleasant and unwholesome smell, which pervades the whole house. Many very cleanly people are not attentive to this particular. Among other things that require attention, fallen leaves should be frequently swept up and properly disposed of. In doors every room should be swept and dusted daily, care being taken not merely to make a decent surface, but thoroughly to cleanse under beds, drawers, tables, and other furniture, and to clean out all closets and lumber holes.

Tobacco and its Uses.

Some time since Blackwood published a curious article on tobacco and other narcotics. The paper is very lengthy, and gives an interesting history of the much used and greatly abused weed. The consumption in this country is immense. In Europe, from the plains of Castile to the frozen Archangel, the pipe and the cigar are a common solace among all ranks and conditions. In vain was the use of it prohibited in Russia, and the knout threatened for the first offence, and death for the second. In vain Pope Urban VIII. thundered out his bull against it. In vain James I. wrote his "Counterblaste to Tobacco." Opposition only excited more general attention to the plant, awakened curiosity regarding it, and promoted its consumption. So in the East; the priests and Sultans of Turkey and Persia, declared smoking a sin against their holy religion, yet, nevertheless, the Turks and Persians became the greatest smokers in the world. In Turkey the pipe is perpetually in the mouth; in India all classes and both sexes smoke; in China, the practice is so universal, that "every female, from the age of eight or nine years, wears as an appendage to her dress a small silken pocket, to hold tobacco and a pipe." It is even argued by Pallas, that the extensive prevalence of the practice in Asia, and especially in China, proves the use of tobacco for smoking to be more ancient than the discovery of the New World. "Amongst the Chinese," he says, "and amongst the Mongol tribes who had the most intercourse with them, the custom of smoking is so general, so frequent, and has become so indispensable a luxury; the tobacco purse affixed to their belt, so necessary an article of dress; the form of the pipes, from which the Dutch seem to have taken the model of theirs, so original; and lastly, the preparation of the yellow leaves, which are merely rubbed to pieces and then put into the pipe, so peculiar—that they could not possibly derive all this from America by way of Europe, especially as India, where the practice of smoking is not so general, intervenes." The largest producers as well as the greatest consumers of tobacco, are the people of the United States—the crop of 1850, according the last census, amounting to two hundred millions of pounds. One of the remarkable circumstances connected with the history of tobacco, is the rapidity with which its growth and consumption have increased, in almost every country since the discovery of America. In 1662, the quantity raised in Virginia—the chief producer of tobacco on the American shores of the Atlantic—was only sixty thousand pounds; and the quantity exported from that colony in 1689, only one hundred and twenty thousand pounds. In two hundred and thirty years, the product has risen to nearly twice as many millions. The extension of its use in Great Britain may be inferred from the fact, that in 1689 the total exportation from the United Colonies to England was one hundred and twenty thousand pounds—whereas it now averages about thirty millions pounds annually. To this might be added the contraband, as the heavy duty of three shillings per pound is a great temptation to smugglers.—*Lynchburg Virginian.*

Pleasant Homes.

The homes of America will not become what they should be, until a true idea of life shall become more widely implanted. The worship of the dollar does more to degrade American homes than anything else.

The chief end of life is to gather gold, and that gold is counted lost which hangs a picture on the wall, which buys a toy or book for the eager hand of childhood. Is this the whole of human life? Then it is a mean, meagre, and most undesirable thing. A child will go forth from a stall, glad to find free air and a wider pasture. The influence of such a home upon him in after life, will be just none at all, or nothing good. Thousands are rushing from homes like these every year. They crowd into cities. They crowd into villages. They swarm into all places where life is clothed with a higher significance; and the old shell of home is deserted by every bird as soon as it can fly. Ancestral homesteads and patrimonial acres have no sacredness; and when the father and mother die, the stranger's money and the stranger's presence obliterate associations that should be among the most sacred of all things.

I would have you build up for yourselves and for your children a home that will never be lightly parted with—a home which will be to all whose lives have been associated with it, the most interesting and precious spot on earth. I would have that home the abode of dignity, propriety, beauty, grace, love, genial fellowship and happy associations. Out from such a home I would have good influences flow into neighborhoods. In such a home I would see ambition taking root, and receiving all generous culture. And then I would see you, young husband and young wife, happy. Do not deprive yourselves of such influences as will come through an institution like this. No money can pay you for such a deprivation. No circumstances, but those of utter poverty, can justify you in denying these influences to your children.—*Timothy Titcomb.*

Origin of the Horse.

The native country of the horse cannot with certainty be traced. He has been found, varying materially in size, in form, and in utility, in all the temperate, in most of the sultry, and in many of the northern regions of the Old World.

In the sacred volume, which, beside its higher claims to stand at the head of the Farmer's Library, contains the oldest authentic record of past transactions, we are told that, so early as 1650 years before the birth of Christ, the horse had been domesticated by the Egyptians. When Joseph carried his father's remains from Egypt to Canaan, "there went up with him both chariots and horsemen." One hundred and fifty years afterwards, the horse constituted the principal strength of the Egyptian army. Pharaoh pursued the Israelites with "six hundred chosen chariots, and with all the chariots of Egypt."

If we could believe the accounts of the uninspired historians, Sesostris, (the monarch probably whom Joseph served,) had twenty-seven thousand chariots of war; and Semiramis, the founder of Babylon, had one hundred thousand chariots, and a million of horsemen; but this was probably a great exaggeration.

Fifty years after the expulsion of the Israelites from Egypt, and in 1450 years before the birth of Christ, the horse was so far naturalized in Greece, that the Olympic games were instituted, including chariot and horse races. We have, therefore, sufficient evidence that the horse was, at a very early period, subjugated to the dominion of man, and unfortunately, for the worst of purposes—the business of war.

From the records of the Old Testament, we are likewise enabled to ascertain the precise period of time, when in Egypt and Canaan, and the neighboring countries, this animal began to be domesticated. Nineteen hundred and twenty years before the birth of Christ, when Abraham, having left Haran, in obedience to the Divine command, was driven into Egypt by the famine which raged in Canaan, Pharaoh offered him sheep and oxen, and asses and camels. Horses would doubtless have been added, had they existed, or had they been subdued in Egypt.

When fifty years afterwards, Abraham journeyed to Mount Moriah, to offer up his only son, he rode upon an ass, which, with all his wealth and power, he would scarcely have done, had the horse been known.

Thirty years later, when Jacob returned to Isaac with Rachel and Leah, an account is given of the number of oxen, sheep, camels, goats and asses, which he sent to appease the anger of Esau, but not one horse is mentioned.

It is not until twenty-four years after this, when the famine devastated Canaan, and Jacob sent into Egypt to buy corn, that horses are first heard of. "Wagons," probably carriages drawn by *horses*, were sent by Joseph into Canaan to bring his father to Egypt. It would seem, however, that horses had been but lately introduced, and were not numerous, or not used as beasts of burden; for the whole of the corn, which was to be conveyed some hundred miles, and was to afford subsistence to Jacob's large household, was carried on asses.

It appears, then, that about 1740 years before Christ, horses were first used in Egypt; but that they soon afterwards became so numerous as to form a considerable portion of the Egyptian army; and when the Israelites returned into Canaan, the horse had been introduced and naturalized there; for the Canaanites "went out to fight against Israel with horses and chariots very many."

The sacred volume, therefore, clears up a paint upon which no other record throws any light—namely, the period when the horse first became the servant of man, at least in one part of the world, and that, the most advanced in civilization, and before Greece was peopled. A long time must have elapsed before man was able to ascertain the value and peculiar use of the animals that surrounded him. He would begin with the more subordinate—those which were most easily caught and most readily subdued; and the benefits which he derived from their labors would induce him to attempt the conquest of superior quadrupeds. In accordance with this, the writings of Moses show us that, after the ox, the sheep, and the goat, man subdued the ass, and last of all, the horse became his servant; and no sooner was *he* subdued, and his strength and docility and sagacity appreciated, than the others were comparatively disregarded, except in Palestine, where the use of the horse was forbidden by divine authority, and on extensive and barren deserts, where he could not live.

When Sir Geo. Ousely traveled through Persia, and the different countries of the East, he examined, among other relics of antiquity, the sculptures on the ruins of Persepolis, and he draws from them a curious and interesting conclusion as to the manner in which the horse was gradually subdued. "There are no figures," says he, "mounted on horseback, although some travelers have mentioned horseback among those sculptures. One would think that the simple act of mounting on a horse's back would naturally have preceded the use of wheel-carriages and their complicated harness; yet no horsemen are found at Persopolis; and we know Homer's horses are represented in chariots, from which the warriors sometimes descended to combat on foot, but the poet has not described them as fighting on horseback. The absence of mounted figures might authorize an opinion that those sculptures had been executed before the time of Cyrus, whose precepts and example first inspired the Persians with a love of equestrian exercises, of which, before his time, they were wholly ignorant.

From Egypt the use of the horse was propagated to other and distant lands; and, probably, the horse himself was first transmitted from Egypt to several countries. The Greeks affirm that Neptune struck the earth with his trident, and a horse appeared. The truth is, that the Thessalonians, the first and most expert of the Grecian horsemen, and likewise the inhabitants of Argos and Athens, were colonists from Egypt."

Library of Useful Knowledge.

Cotton in England.

Cotton, as a raw material, admits of being wrought into garments for the poor at the low sum of twelve cents per pound weight; whilst a single pound of long staple cotton, worth eighty-five cents, can be made to furnish employment and wages to the extent of one thousand dollars for the rich. The material for a full dress of outer garments, if composed of wool, would cost not less than eight dollars, whilst the same quantity of material for cotton, and of more durable quality, would be two dollars to two dollars and a half. The laborer's wife may purchase a neat and good cotton for eight cents per yard, making a dress for fifty-six cents.

The cheapness and utility of cotton have commanded for it a preference which is almost universal, not only for decorations and clothing but for bookbinding, as a substitute for leather, and for other purposes. The waste cotton made during the process of manufacture, is wrought into coarse sheets and bed-covers, which are sold at from twelve to eighteen cents per pound. The residue of the waste is used for the manufacture of paper, the cleaner portion being for writing paper, and the sweepings from the floors of factories supply a large proportion of the paper mills of Lancashire with the raw material of the paper which is used for printing books and newspapers.

An advance of one English penny in the price of cotton amounts to twenty millions of dollars a year. The present stock in Liverpool is only equal to the consumption of three weeks. That from Africa, last year, would run the entire English mills just *one hour!* The entire failure of a cotton crop would entirely destroy, and perhaps forever, all the manufacturing prosperity England possesses; a reduction of the crop from three to one million of bales, would reduce the manufacturing and trading classes to irretrievable ruin; millions would be deprived of food, and, as a consequence, Great Britain would be involved in a series of calamities, politically, socially and commercially, such as cannot be contemplated without dismay.

In view of this state of things the manufacturers have formed themselves into a Cotton Supply Association, for the purpose of diffusing information on any new point for the culture of cotton. But they have already ascertained that obstacles exist, local or political, which would render it inexpedient to raise the necessary capital for an investment; they are looking eagerly, anxiously, to Africa and India; in the former there can be no hopes for immediate results. The remodification of the Government of India may possibly produce a change, and great efforts will now be made to do something practical in the way of European settlers, tenure of land, improved modes of transit and bounties for encouragement.—*Horticulturist.*

How the Chinese Make Manure.

In connection with our remarks, last month, about poudrette, we wish to state how the Chinese manage the manure-heap. It has often been the wonder of farmers in this part of the world, how the Chinese, with but few domestic animals, have been able to keep their lands in a high state of fertility, and to sustain such an immense population. We do not now wonder so much, when we know what pains they take in the saving and manufacture of manures.

Having very few horses or cattle, and therefore little barn yard manure, they save all the human excrements. And not only the solid parts, but the liquid, which, being diluted with water, they apply to the roots of all growing plants. The country people visit the cities and large towns regularly, and carry off the contents of privies and urinals at a stipulated price, which they make into poudrette, somewhat in the manner we have formerly specified. The publicity of "necessaries," and the unblushing display of chamber vessels everywhere, at first shock Occidental sensibilities; but custom and the usefulness of the fertilizing materials thus saved, soon reconcile one to the singular usage.

Oil-cake is another of their manures, made from a bean. This bean is crushed, then steamed, and an oil pressed from it, and the cake which remains becomes an excellent fertilizer. It is often used in a liquid form, having been broken up and steeped, and then reduced by the addition of considerable water.

The Chinese use the sediment collected from the bottom of their canals, for manure. They dig large pits, into which they throw successive layers of canal mud, weeds, straw, garbage and all corruptible matters. When a pit has become full, it is cleaned out, and filled again in the same way, so that, in the course of a year, a large quantity of compost is sec red. Nor is that all. Ashes of all kinds are preserved, and used with the greatest economy. The hair from the barbers' shops are saved, and sold at so much a pound. Boys go about the streets, with rake and basket, gathering up everything which can be converted into manure, certain of finding ready sale for it.—*American Agriculturist.*

Managing Windows for Air.

There is always a draught through keyholes and window crevices, because as the external air is colder than the air in the room we occupy, it rushes through the window-crevices to supply the deficiency caused by the escape of warm air up the chimney. If you open the lower sash of a window, there is more draft than if you open the upper sash. The reason of this is because if the lower sash be open, cold air will rush into the room and cause a great draft inward; but if the upper sash be open the heated air of the room will rush out, and of course there will be less draft inward. A room is best ventilated by opening the upper sash, because the hot vitiated air, which always ascends towards the ceiling, can escape more easily. The wind dries damp linen, because dry wind, like a sponge, imbibes the particles of vapor from the surface of the linen as fast as they are formed. The hottest place in a church or chapel is the gallery, because the heated air of the building ascends, and all the cold air which can enter through the doors and windows keeps to the floor till it become heated.

Special attention should be given to the ventilation of sleeping-rooms; for pure air, and abundance of it, are, if possible, more necessary when we are asleep than when we are awake. Sleeping-rooms should be large, high and airy, more especially in warm latitudes, and in situations where the windows have to be kept closed at night on account of malaria.—*Scientific American.*

Betsy Baker's Bonnet.

The collection in the rooms of the Rhode Island Society, for the encouragement of domestic industry, has received an interesting addition—a bonnet braided by Mrs. Betsy Baker, in exact imitation, braid, shape and trimming, of the first straw bonnet ever braided in this country. Sixty-one years ago, when this venerable lady was a blooming maiden, she determined to have a straw bonnet, not knowing any other way to get it than to braid it herself, Miss Betsy Metcalf, that was her maiden name, saw an imported dunstable straw bonnet in Col.

Whipple's store, and being a true Yankee girl, she set herself to work to imitate it. The interesting memoir upon straw braiding, contributed by Judge Staples to the last volume of the Transactions of the Domestic Society, shows how she succeeded. With no instruction, without the opportunity of unbraiding a specimen of the work to see how it was done, she persevered until she made a bonnet that was the envy of the other girls. Thence sprung a business which to day employs 10,000 people, and turns out 6,000,000 bonnets and hats annually, in the single State of Massachusetts.—*Prov. Journal.*]

For the Southern Planter.

Important to our Agricultural Community.

As the season for saving the corn crop approaches we would call the attention of Planters in every section of the country to whom the transport by navigable rivers is available, and indeed of all, to the opening of a market for a portion of the produce which the majority of them have hitherto little better than wasted, namely, their shucks, which are frequently left on the stalk. If the object to which we allude be cherished, it will become an important source of revenue to them.

It should always be the policy of the Planter to encourage the consumption of his products in manufacturing processes, though it be a portion of his provender, because, whatever portion can be used for other purposes than provender, will necessarily enhance the value of the remainder; and with very little extra exertion he can double his product of provender. We therefore urge upon their consideration the propriety of devoting all their shuck crop to manufacturing purposes. Let it be remembered that every barrel of corn will yield from 50 to 60 lbs of shucks. And we understand that parties are making arrangements to prosecute very extensively the preparation of shucks for mattresses, and will shortly be prepared to contract for all that can be delivered to them in New York or this city. They are now making arrangements to be able to supply the best and cheapest Baling Presses to all who are disposed to put them up for them.

HENRICO.

Box Edging.

Few people except professed gardners, know how this handsome border ornament ought to be planted. It is usually stuck in a few inches and left struggling on the top of the ground, with three or four times as much *top*, and three or four times less *bottom*, than it ought to have. Box grows nearly as well from the branches as the roots. Now, the trench in which the edging is to be planted should be full spade deep on the border side, being a few inches shallower on the alley side—the soil should be made fine—and the box inserted to the bottom of the trench, packed in tightly with soil, leaving only from one-and-a-half to two-and-a-half inches out of ground. There will be no danger of it not growing, or producing full foliage at the ground. Of course no one would think of planting box without a *line*.

Trimming box edging is rarely performed either skilfully or judiciously. Instead of cutting off the top squarely, and below the preceding year's growth, let it be pruned to an angle, like the letter Λ, taking care not to cut below the new growth, and you will, through the whole season, have a beautifully green, thrifty edging.—*Germantown Telegraph.*

Another Cure for Hydrophobia.

A correspondent of the St. Louis *Republican*, says:

"Eighteen years ago my brother and myself were bitten by a mad dog. A sheep was bitten at the same time. Among the many cures offered for the little boys, (we were then ten or twelve years old,) a friend suggested the following:

"Take the root of the common upland ash, peel off the bark, and boil it to a strong decoction; of this drink freely. Whilst my father was preparing the above, the sheep spoken of began to be affected with hydrophobia. When it had become so fatigued from its distracted state as to be no longer able to stand up, my father drenched it with a pint of the ash ooze. Four hours after the drench had been given, to the astonishment and joy of all, the animal got up and went along quiet with the flock grazing. My brother and myself continued to take it eight or ten days—one gill three times a day. No effect of the dreadful poison was ever discovered on either of us."

The Southern Planter.

RICHMOND, VIRGINIA.

Preparation for the Wheat Crop.

All lands which may be fallowed within the next six weeks, will, of course, require no farther plowing. The early fallows will probably have so strong a covering of grass and weeds, as to make it necessary either to re-fallow them thoroughly, or else to harrow well before sowing the wheat, which should be "put in" with a single plow. Lands are benefitted by the covering and shading of pea-vines, and clover, in so great a degree, as to make it desirable not to turn these crops in at a very early period—but naked fallows are best made as soon in the season as is practicable. In proof of this opinion we may mention the fact, that on a small field belonging to the former Editor of this paper, the wheat growing on one half of it, which was fallowed in May, 1858, manifested a superiority over that growing on the other half, (fallowed the September following,) equal, at least, to an application of 100 lbs. guano to the acre. We supposed, when looking at it, that one half had had a liberal supply of guano, while the other part of the field was unassisted by manure of any kind. Of the modes of fallowing, we believe *deep* plowing to be best for *stiff* clay soils—while depth of furrow is not required by light lands. At the same time, we would recommend width of furrow sufficient to cover up with dirt, any grass or weeds on the surface—for the double purpose of getting them out of the way, and fertilizing the soil by their subsequent decomposition.

Stiff lands require to be so plowed as to prevent, as far as is possible by plowing, any redundancy of water during the winter season, since wheat best flourishes on dry soils. This end may, in a great measure, be attained (in the absence of thorough draining) by plowing deep, and putting the land in beds. All water falling on the surface must be gotten rid of, either by conducting it into drains of some kind, which will *hurry it off*, or else by absorption, or evaporation. If the pores of the ground are closed by water, there must of necessity be much less aeration of the land than usual. The crop must, in consequence, suffer by the cutting off of this important source of supply for both carbon and nitrogen—besides, the risk of "winter killing" is greatly increased, since the soil will be colder, and more liable to freezing and thawing in rapid succession, and every farmer knows that wheat is always most "winter killed" in wet spots. Again: If manures are used, the crop will be only partially, if at all benefitted by them, because we have just seen that two most important agents in the decomposition of manures (by which they are reduced to a condition for assimilation by plants) are cut off, viz: air and heat. The crop will mature later, (to say nothing of the greater risk of rust, &c.,) and the ground will, in the spring, be in bad condition for the reception and germination of clover seed, for the evaporation of the water on the surface will cause it to *bake* hard, while the heat, which the soil would otherwise get the benefit of, is lost to it by this process of evaporation.

On all tenacious soils—unless they are of so undulating a character as to have sufficient natural vents for the water which falls on them to run off speedily,—we think beds should be thrown up of such a width as will best assist drainage. We have plowed our own land in beds of various widths, and prefer to have them, in places requiring much drainage, 15 feet wide—but we think this width too narrow for most lands, since the numerous water-furrows are objectionable, unless they are an absolute necessity. They will interfere with harvest operations. We abhor the old-fashioned "single beds," since the many water-furrows not only occupy a considerable space in a large field, but they have a slovenly and unsightly appearance. We never put a bed in any place where we think we can avoid risk to land or crop by its absence. But on slopes even, we consider "head," or "catch drains," necessary, to arrest the volume of water running over the ground, before it traverses the *whole* surface, because thereby the danger of washing is greatly diminished—the amount of rain-water is *hurried* and *forced* into the channels of these artificial outlets, and the land thus sooner becomes dry and warm. Besides, no part of the arrable soil will then receive more water than falls upon it, and, consequently, there will be better *aeration*, and less retention and evaporation of water.

Water-furrows should terminate in drains of sufficient capacity to empty them speedily, and prevent any backing or overflowing. We have found the method of plowing flat lands proposed by Mr. Edmund Ruffin, a great assistance in draining, and have been pursuing that course since the publication of his plan and diagram in the "Transactions of the Virginia State Agricultural Society." We recommend it to the attention of every man who has flat land to plow.

The preparation of seed requires care. If seed-wheat is repeatedly fanned, and the mill *blown hard*, it may be rendered free from much cockle and other impurities. The cleanest and best of the crop should be selected for seed, after which everything but the pure grain should be taken out as far as practicable. Get rid of as many of the light and defective grains as possible.

Of the manner of sowing. We believe the drill is the best of all methods for putting in the crop. It is claimed for this mode of sowing, that it is a means of getting rid of "underling" heads—the straw is of equal length, and there is much less danger of winter killing, in consequence of the dirt's falling after freezing around the roots, which is almost equal to a working—while it insures a good covering to the roots. The next best method of seeding, is covering with the single plow. The lap of the furrow producing what the English and Scotch farmers call ribbing, by means of which nearly all the advantages of drilling are attained.

In the application of fertilizers, there can be no doubt of the economy of using those of concentrated strength in the drill, with the wheat, at the time of sowing. If this be done, we strongly recommend the use of plaster with them. Ashes, also, (although apparently incompatible with guano,) are a great help to the wheat crop, when mixed with it. True, they will cause the escape of Ammonia from guano—but this loss may, in a great measure, be avoided by not mixing them until ready for sowing, and as soon as the mixture is made it may be put into strong cotton bags. The escape of ammonia *under ground* makes no difference, in our opinion, as it is soon fixed by the clay. We have tried this plan with good results, and seen it turn out well on the farms of several other persons.

Sowing grass seed with wheat. A nice and thorough preparation of the surface soil is necessary for the reception of grass seed. The seed should be sown after harrowing has been well done, and covered lightly. The covering may be efficiently and neatly accomplished by running over the ground "Dewey's Gleaner," or spring-tooth rake. Some of the best crops of clover we have ever seen, were seeded in the autumn with wheat. Timothy may also be seeded in the fall. We have had the pleasure of seeing one "fine stand" of timothy this season, which was seeded with the last wheat crop. The best time for sowing these grass seeds, is with the late sowed wheat. We generally have wet weather early in November, after a "dry spell" in October; and the best time for putting in clover and timothy seed, is after the rains of November, as soon as the ground is in proper condition for harrowing. Should they be sown early in the fall, they are apt to be killed out in October.

Veterinary College of Philadelphia.

We have received in pamphlet form the first annual announcement of the above institution. We cannot better express our sense of its great importance, than by laying before our readers the programme of the fourthcoming course of lectures, the list of the Faculty, the expenses of the student, &c., &c.

The subject is of universal interest to our agriculturists, and we tender them our hearty congratulations, that it is at last about to be redeemed from the neglect and indifference to which it has been so long abandoned.

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"VETERINARY COLLEGE OF PHILADELPHIA.

"This Institution, chartered by the Pennsylvania State Legislature, 1852, will be put into operation the present year at Philadelphia, where it will be permanently located.

"The necessity for such an Institution in this country has long been felt, but for the want of qualified Veterinary Practitioners, it has been deferred to this late day.

"Philadelphia, the great emporium of medical science on this continent, has been chosen as the most suitable place in which to rear up an Institution, for the promulgation of a sister science. The reputation of her Medical Schools, extends over the whole civilized world. The facilities for Anatomical investigations, Clinical instruction, &c., &c., are at least as great as those of any other city in the Union. The Museum of the College already embraces a collection of Pathological Specimens, in point of excellence far surpassing those of many European Veterinary Colleges of many years standing. Over one thousand preparations have already been deposited in the College Museum, the skeletons of the pacing horse "Hiawatha," the trotting horse "Blue Dick," a Shetland Pony, formerly belonging to Welch's Circus Company, &c. A Mule, a Cow, a Hog, and a Dog, each neatly mounted in wires, add interest to this valuable collection. The Lecture room is conveniently and comfortably fitted up. The Dissecting rooms are sufficiently large, and afford every facility for pursuing Anatomical investigations, material in abundance always at hand, without extra charge. The Library contains a number of the most valuable Veterinary works published in this country and in Europe.

"In establishing Veterinary Colleges in this country, a new field is opened to the votary of Veterinary science for extensive investigation, wherein to build up fame and fortune.

"A man with but ordinary abilities, with proper energy, can distinguish himself in the world by embracing this profession, while in most others he would only arrive at mediocrity; here is an unbeaten path for him to pursue, which, if faithfully and honestly followed, will lead to usefulness and honour.

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"TRUSTEES.

"Gen. George Cadwalader; Prof. William Gibson, M. D.; John Philips, M. D.; Alfred L. Elwyn, M. D.; Hon. Frederick Watts; Gen. George M. Keim; James Gowen, Esq.; Hon. George W. Woodward; Sketchley Morton, Esq.; Alonzo Potter, D. D.; James Bryan, M. D.; L. L. Ward.

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"FACULTY.

"W. W. Fraley, V. S., Professor of Meteria Medica and Therapeutics.

"T. J. Corbyn, V. S., Professor of Pathology, Surgery, and Practice of Medicine in reference to all domestic Animals.

"G. W. Bowler, V. S., (of Cincinnati,) Prof. of Medical Chemistry and Pharmacy.

"R. Jennings, V. S., Prof. of Anatomy, Physiology, and Operative Surgery.

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"SESSION OF 1859–60.

"The regular Lectures of the course will commence on the first Monday in November, and continue daily for sixteen consecutive weeks. The lectures embrace all the several departments of Veterinary Medical Science; as taught in the regular Veterinary Institutions of Europe.

"The lectures of the Faculty, embrace:—

"I. MATERIA MEDICA.

"The commercial, Physical history, properties and modes of action of the individual articles of the Materia Medica.

"II. PHARMACY.

"The mode of preparing medicines for use, together with their doses and therapeutic effects on horses, cattle, &c.

"III. THERAPEUTICS.

"The treatment of the various diseases incidental to the Horse, the Ox, the Sheep, Hog and the Dog, &c.

"IV. ANATOMY.

"1st. Osteology, or a description of the bones; 2d. The Ligaments; 3d. Myology or muscles; 4th. Neurology or an account of the brain and nervous system; 5th. The general structure of the body, the various tissues, &c., &c.

"V. PHYSIOLOGY.

"The functions of life, the circulation of the blood, function of the Heart, Arteries, Veins and Capillaries, with the composition of the blood, &c.

"VI. PATHOLOGY.

"The effects of diseases upon the animal economy, change of structure arising from morbid action, causes, symptoms, and development of diseases.

"VII. SURGERY.

"Local or Surgical Pathology; embracing an account of such diseased conditions as may demand surgical intervention.

"The lectures will be illustrated by drawings, diagrams, wet and dry preparations, bones, skeletons, preparations in wax, papier mache, and plaster, and the usual appliances for demonstrating this science.

"Medical and surgical cliniques, will be given Wednesdays and Saturdays of each week during the session, patients will be placed in charge of the students under the direction of the faculty, thus giving them an early opportunity of acquiring practical as well as theoretical knowledge, in fact every facility will be afforded to perfect their education.

"REQUIREMENTS OF STUDENTS.

"Each student will be required to attend two full courses of lectures previous to graduation, one of which must be in this Institution, in addition to which he will be required to study at least two years under some respectable practitioner of veterinary medicine, either before or during his term of college instruction.

"APPLICANTS FOR GRADUATION.

"1. Each candidate shall have arrived at the age of 21 years.

"2. He shall have attended two full courses of lectures; one of which must be in this Institution.

"3. He will be required to present a thesis written in his own hand, on some Veterinary subject, which must be presented at the time of making his application.

"4. He will be required to furnish evidence from his preceptor that he has received the necessary office instruction, and that he has attended two regular courses of lectures.

"5. A two-third vote of the Examining Committee, composed of not less than three medical practitioners, and the same number of Veterinary Surgeons, whose names shall be affixed to the diploma, will be necessary to entitle the candidate to the degree of Veterinary Surgeon.

"For the encouragement of those whose means are too limited to allow of the usual expenditure, six students will be admitted annually on the payment of thirty dollars each for the first course, exclusive of the matriculation and graduation fees, and for the second course the sum of twenty dollars. These arrangements will be strictly confidential, and no distinction will be made between the beneficiary and other students. Persons making application on these terms, will be required to do so in writing, accompanied by testimonials of character, want of means, &c., previous to the opening of the session. If more than six applications are received, the successful candidates will be duly notified.

"The regular session will commence on the first Monday in November, 1859, and continue four months.

"FEES:

First course,	$100 00
Matriculation, paid once only,	5 00

The first being in this College.

Second course,	$50 00
Graduation,	25 00

No fees for lectures after second course.

"Good board may be obtained form $2 50 per week upwards.

"Further information may be obtained on application to

"R. JENNINGS, V. S., DEAN,

"*No.* 1526 *N. Fourth St., Philada., Pa.*"

Descriptive Catalogues,

Nos. 2, 3 and 4, of Fruits, Ornamental Trees, Shrubs, Vines, Roses, &c., and Dahlias, Verbenas, Fuchsias, Petunias, Heliotropes, Miscellaneous Bedding Plants, Camellias, Geraniums, &c., &c. With other Green House and Hot House Plants, cultivated and for sale by Thorp, Smith & Hanchett, at the Syracuse Nurseries, New York.

The Proprietors in their introductory say:

"The extent of this establishment,—now one of the largest in the United States,—the thorough manner in which its business is conducted, the excellence and variety of its productions, the moderation of its prices, the convenience of its location, the completeness of its arrangements, and its facilities for the prompt execution and ready transmission of orders, give it claims upon the consideration of the public second to none other in the country."

We are indebted to them for the following:

"HINTS ON THE TRANSPLANTING AND MANAGEMENT OF FRUIT TREES.

"1. Let the hole be dug from twelve to eighteen inches deep, and large enough (the larger the better) to receive the roots without cramping; throw back and scatter the subsoil, and partially fill the hole with good surface earth, so as to fit it for the tree to stand about as deep as when in the nursery.

"2d. Prune off the ends of all the roots, leaving them fresh and free from bruises, and put the tree in the place prepared—cover the roots lightly with rich, mellow earth, pour on water, and work the tree gently up and down, alternately adding earth and water until every cavity is well filled. Or better, work the earth thoroughly around the roots with the hands.

"3d. Pack the earth firmly by pressing it with the foot from the circumference of the hole, towards the body of the tree, then throw in one-third of a wheel-barrow load of well-rotted manure, cover it with about two inches of earth, and press the whole well down, leaving it a little crowning about the tree. If planted in Autumn, the earth should be heaped from eight to twelve inches high around the body of the tree. This serves the three-fold purpose of supporting it in an erect position, protecting it from mice, and preserving the roots from the action of the frost. In the following Spring the earth should be removed.

"4th. Trim up the tree to four or five limbs, suitable to form a top, and cut each of the side limbs back to a bud within four or five inches of the body, leaving the central or leading limb from eight to twelve inches long. But when there are no side limbs suitable for this purpose, the tree should be divested of all its branches, and headed back to a height proper to form the top. If planted in Autumn, this pruning should be deferred until early in Spring; but it should by no means be neglected altogether as nothing so much conduces to the success of transplanting, and to the subsequent beauty and prosperity of the tree. This direction is applicable to fruit trees of all kinds.

"5th. For an orchard, the soil, before planting, should be made mellow by repeated plowing, and kept constantly cultivated for several succeeding years. For this purpose potatoes, beets and other low-hoed crops, are best, as they give the trees the frequent benefit of the plow, the cultivator and the hoe, and leave them in the full enjoyment of the necessary stimulants of air and light.

"PRECAUTIONS.—First. If the trees come to hand while the earth is too wet to receive them, bury their roots until the condition of the earth is more favourable. Second. If the roots become dry from too long exposure, place them in water, and let them remain from twelve to twenty-four hours. Third. To protect them from drought, nothing is so effectual as to spread a covering of straw, loose litter, or leaves, about their roots, after the transplanting is completed. This keeps the earth light and moist. and renders the too often injurious process of watering unnecessary. It should be practised, however. only in Spring. as in Autumn it would afford lodgment for mice. Fourth. To prevent injury from these little depredators. stamp the snow around the bodies of all young trees several times during the winter. It may be done most effectually during a thaw."

Hungarian or Honey Blade Grass.

Some of our exchange papers speak of this grass as a humbug. So far as the exorbitant price demanded for it is concerned, we endorse their opinion; and would not advise any one to purchase it, except on a very small scale. We have not attempted to raise any of it on our own farm, but have seen some half dozen patches growing on the farms of our neighbours. These gentlemen have not yet acquired sufficient experience with it to be able to speak very strongly in favour, or in condemnation of it.

Of course we can say nothing of it, as an article of food for stock, compared with other well known grasses; but we have been agreeably surprised at its general appearance and luxuriance of growth. If any of our Virginia or North Carolina friends have tested its merits in such manner as will entitle them to speak of it impartially, we shall be glad if they will furnish us the result of their experience.

Beautiful Specimens of Fine Fruit.

Mr. H. J. Smith has presented us with two varieties of pears grown on dwarfed stocks on his premises, which are equal in size, appearance and flavor to any specimens of the same varieties we have ever seen. He has fourteen varieties of dwarf pears, all of choice kinds and prolific bearers. On one tree, about six feet high, a visitor at his garden counted ninety-six pears, of healthful appearance and vigorous growth. He has high celebrity for the production of the best fruits and vegetables.

The Farmer's Journal.

Mr. Pleasants, who has ably conducted the editorial management of the *Southern Farmer*, has associated with him Mr. Smyth, and the name of the paper will in future be "The Farmer's Journal."

We hope these gentlemen will be eminently successful in their enterprise.

Mr. Pizzini's Candy and Ice Cream Palace.

A very elegant and handsome new store has just been opened by the enterprise of this gentleman, on Broad street, in this city.

Mr. P., if *not a farmer*, deserves to be considered at least in the light of a relative to that honorable class, as his saloon is a good market for strawberries, milk, &c., which are generally *improved* in quality by his skillful treatment of them. We enjoyed the pleasure of an inspection of his beautifully frescoed saloon, together with an abundant supply of eatables and drinkables, which his hospitality furnished to the editors of this city. As sincerely as any gentleman "connected with the Press," do we wish him prosperity and contentment—"*the best of everything" he has already.*

For the Southern Planter.

WARREN Co., N. C., Aug. 12, 1859.

Will some farmer give us his experience with the following articles as manure for wheat, viz: "Rhodes' Super-Phosphate of lime," and the *Mixture of Peruvian and Sombrero Guanos, in equal quantities?* State what quantity of either is advisable to use on fair corn land; and if he has a decided preference for one of these articles as superior to the other, mention which he prefers. A SUBSCRIBER.

We invite responses from our friends to this query. Also, reports as to the "Comparative Economy of using 'Manipulated' and 'Peruvian' guanos."

Agricultural Fairs of Virginia, 1859.

The *Central Society* will hold a Fair on their new and handsome grounds near this city, on the 25th, 26th, 27th, 28th and 29th of October.

The *Seaboard Society*, in Norfolk, 8th, 9th, 10th and 11th November.

The *Lynchburg Society*, in Lynchburg, commencing October 18th.

The *South-Western Society*, at Wytheville, 12th and 13th of October.

The *Virginia State Society*, associated with the *Union Society of Virginia and North Carolina*, will hold a Fair on the ground belonging to the latter, near the city of Petersburg, on the 1st, 2d, 3d and 4th of November.

We trust that the interest hitherto manifested by the citizens of our good old Commonwealth in these Exhibitions, of not only the various fine animals owned within our borders, but of her own 'fair women and brave men,' together with the evidences of her industry, skill, liberality and good taste, will ensure successful Fairs in all these places, and that the articles, of every class, exhibited may be characterized by excellence and variety, besides being too numerous to mention.

Among the new business enterprises of our city, we are glad to learn that a large *Paper Mill* is to be erected speedily, and also a *Sugar Refinery*.

Mr. F. G. Ruffin has a large mill *in operation*, grinding and preparing the ingredients of his "*Phospho-Peruvian Guano*."

Thus it will be seen that purchasers can procure *at home* articles which are always wanted and which many of us have to *send after*, in order to procure them. We hope these new enterprises may be eminently successful and prosperous.

Our thanks are hereby tendered to the following gentlemen, for pamphlets sent us:

Messrs. A. Frost & Co.—Descriptive Catalogue of Dahlias, Verbenas, &c., and Fruits; cultivated and for sale at "Genesee Valley Nurseries," Rochester, N. Y.

Messrs. W. M. Hoyt & Co.'s Catalogue of Fruits, Trees, Shrubs and Evergreens; for sale at "East Avenue Nurseries," near Rochester, N. Y.

To the President of the Agricultural and Mechanical Association of St. Louis, Missouri—for Schedule of their Premiums, amounting to $20,000.

Edward Warren, M. D.—for the *Medical Journal*. Published at Edenton, N. C., at $3 per annum, in advance.

Finch's Grease Extractor.

We have received from Mr. Edward T. Finch a phial of his preparation for removing paint, tar, wax, and any kind of grease, from silk and woolen dresses. Price 25 cents.

As we made trial of the article with the intention of speaking plainly our estimation of its merits—whether good or bad—we take pleasure in assuring our readers that it is no humbug, but really a very effective application for the removal of grease spots from woolen clothes, and we doubt not from silk goods also, though of this we cannot speak from experience. Try it.

Fine Sheep.

We call attention to the advertisement of Dr. John R. Woods' fine sheep, in our advertising columns. To those who are acquainted with him, no other recommendation than his name is needed; others, we would refer to the published results of the Annual State Agricultural Fairs, for the high estimation in which his stock generally, and his sheep particularly, have been held.

He has just imported a Cleveland stallion, considered by his purchasing agent the best to be bought in England, and by many good judges superior to the noble animal "Napier," which he was so unfortunate as to lose on his homeward passage last year.

From the American Agriculturist.

Agricultural Exhibitions should be Something More than mere Shows.

It is a matter of great importance, that our agricultural exhibitions should not be mere gala-days, fo. sight-seeing and gossiping. The holiday uses of the occasion is all well enough, but the managers of these fairs should bear in mind that they have a more sober aim. They will profit our husbandry just as they are made to disseminate the correct principles that underlie our farming interests. There needs to be some reform in our premium lists, that shall reward the *principles* rather than the *facts* of husbandry.

A large crop of corn, one hundred bushels to the acre, or more, is a good sight, and worthy of reporting. But the statement which involves the principles by which such a crop was grown, is worth much more to the world. That will teach other farmers how to raise maximum crops of corn, at the least expense. A fat ox is worth going to see, but what we are most anxious to know, is, whether the flesh and fat has been laid upon the bones so as to pay expenses. The men who make a living by fattening cattle, cannot afford to make playthings of them. If our agricultural societies can show that beef can be made for eight cents a pound, when it is selling for nine and ten, farmers have a rational motive for producing beef. The whole details of the process will be read with the liveliest interest, and will be of direct pecuniary value in the community. But if, in the same state of the market, it costs eleven and twelve cents a pound to make fat beef, who is benefitted by the exhibition? The premium should be offered and paid to the man who will best illustrate the principles of producing beef *economically.*

And so, in all depa tments of the exhibition, the chief attention should be given to the economy of production. We exhibit annually the best products of our farms and orchards, our meadows and pastures. The multitudes gather from the farms and the villages to behold the fine horses and cows, the splendid fruits and vegetables, and t e irreproachable butter and cheese. They wonder and admire, and are doubtless, stimulated to do something better in their husbandry, but without receiving any definite information, as to the best methods of realizing their wishes. They have set before them, in these fairs, good examples of stock raising, fruit growing, and field cultivation, but they get few of the secrets of that skill which is everywhere visible. To multitudes, these fine fruits and products are as great a mystery as if they were the results of legerdemain. Neither themselves nor their neighbors ever secured such results, and they do not understand the philosophy of a hundred bushels of corn to the acre, or of Duchesse pears weighing a pound and a-half a-piece. The fair doe not give to them a single new principle, nor suggest to them a better method of cultivating a single crop.

The time has come, we think, when agricultural societies, while they pay no less attention to *things*, should pay far more attention to *principles.* It should be a leading aim with the managers of these institutions, to instruct the communities in which they are located, in the principles of husbandry.

The addresses, the report , and the statements of exhibitors, where these are required, need to be more carefully prepared. Too often the address is from a gentleman, eminent only in political life, and as ignorant of farming, or any other industrial pursuit, as he is of Sanscrit The best occasion in the whole year, with its audiences of thousands, and its glowin inspiration, is absolutely thrown away. The reports are often made up by a fourth-rate lawyer, whose chief qualification for the office is, that he has little business of his o n to attend to. The statemen s, if mad by practical men are often defective in essential d tails, so that they are no guide to inquirers after the *principles* of husbandry.

We call for a reform in the management of societies, so that the whole exhibition shall be a contribution to the science of agriculture. We want to understand the experience and the practical skill that has produced the crops, much more than to see the results of this skill.

Galloway Cattle.

We believe we are almost the only friend of the Scotch race of cattle, called Galloway, (sometimes called "polled" or no horns,) that they have in Maine. At any rate, neither the cattle nor the friends of them are very plenty among us. At our suggestion the Trustees of the State Society, willing to encourage the breeding of all useful animals in the State, very readily made a class of them in their list of premiums. A few were exhibited, but they had to take a by-corner of the field, and the committee who examined them, and awarded premiums on them in accordance with the schedule, made the remark in their report, that they could not recommend them for general distribution about the country, or words to that effect.

On that point we take issue with them. We are willing to accord to the other breeds of cattle, all the merits that belong to them. We have in times past, bred Durhams and Herefords, and other breeds. Indeed, we were the first who ever introduced a thorough-bred Durham into the State.

These and other breeds have their good qualities and their failings, and we have long since been taught by the lessons of experience, (and some of them were rather dear,) that you cannot get all the properties you want in a stock of cattle in one hide. That God has made different races of what we call farm stock, and that the art of man has formed from them varieties which we call breeds,—that the farmer must consider what his wants are, and the capacity of his farm is, and choose such races or such breeds as may be best adapted to the circumstances. He may, therefore, cultivate one, two or more of these breeds or races.

We have also become convinced from experience, that, in a large part of Maine, the Scotch cattle, such as Galloways, (those which have no horns, and the West Highlanders which have horns) are the best adapted for raising beef of the very best quality in the world, quickly and cheaply. As yet, none of the West Highlanders have been introduced. Of the Galloways there are a few, and with all due deference to our respected friends of the committee, we shall do what we can to have more of them. Adapt your stock to your wants and your means. We know that the rearing of large, stately oxen for the lumber market and other markets, is profitable; and we say to those in a condition to do it, and have the taste for it, go on and prosper in the business. But, that the beef that these animals make, is the best and most profitably raised is a mistake. For heavy teams of excellent workers, they are what you want, but the rearing of beef is an object too, and that animal which will afford you the best quality at the least cost, is found in the Scotch cattle. We know this from experiment with all the breeds, (except Devons and West Highlands,) and our experience is but a corroboration of those who have had older and still more experience. This is often expressed on the other side of the water.

The Mark Lane Express, speaking of the late show of the Highland Agricultural Society, at Aberdeen, says that at dinner, Mr. Torr, in some remarks, said—"Whatever you do don't neglect the native breeds of Scotland. Depend upon it, the nation does not possess more valuable animals than these native breeds." The Express adds—"We fancy he was speaking here to the merits of the polled beasts, but the Highlanders are, in their way and for their purpose, as worthy of proper cultivation."

Mr. Howard, Editor of the Boston Cultivator, who has recently been in Scotland, examining and purchasing cattle there, says, in regard to the above remark in the Express: "We second these observations, being satisfied from what we saw of these breeds in Scotland, that they are very valuable, and we hope to see some fair trials yet made of them in America."

If great Britain does not contain "more valuable animals than these native breeds," we certainly should not despise them.

[*Maine Farmer.*

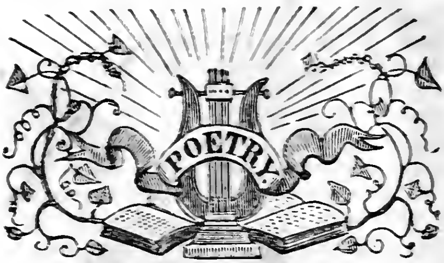
Cellar for a Farm-House.

There are few departments of the farm-house that are of more importance than the cellar, yet it is perhaps more generally neglected than any other part of the premises, being out of sight, it is left to take care of itself, and will seldom bear very close inspection. There should be a reform here, and I will state what I consider the proper mode of constructing a good and convenient cellar.

After settling in your mind the proper height of the cellar, (which should not be less than seven nor more than eight feet high,) dig one foot deeper than you intend the bottom when finished; then dig under at the bottom all around from four to six inches, and lay a course of flat stones projecting beyond the outside of the main wall at least four inches, to prevent rats from working under. Lay your foundation in water lime mortar, carrying it up in the same as far as you can be safe from frost; and the remainder in quick lime mortar. Lay the wall in two distinct courses of stones, and do not allow the inner and outer stones to touch each other, but fill the middle with mortar to make a solid wall. Make your windows with double glass shashes, and you need have little fear that frost will penetrate to injure anything.

If your cellar bottom is dry, porous, gravelly soil, you do not need a drain, but that is seldom the case. The sure way is to dig a drain from one side to carry off superfluous water, and if a wet, clayey bottom, lay drain tile around or through it, so as effectually to draw off all the water, and then cover the bottom between and over the tile with small stones to the depth of one foot, and cover the whole with water lime cement. In situations where there is no fall for draining, the sides may be plastered with cement, to keep out water as much as possible. Lay timbers down while the mortar is soft, for sills to be used for divisions, and make simple board partitions, as they are less expensive than brick, and answer equally well in most cases.

The cellar should be divided into at least four apartments, viz:—a milk room, fitted with shelves for the milk pans; store room for provisions, with cupboard, &c.; a larger apartment for the storage of fruit, cidar barrels, &c.; and a dark room for potatoes and other vegetables, as they keep better, when excluded from light. Have ample arrangements for lighting and ventilating all the apartments, (except the dark one,) at all times, and you have a place for everything necessary about a cellar, and with but little expense after once built.—*Gen. Far.*



The Day is Done.

The day is done, and the darkness
  Falls from the wings of Night,
As a feather is wafted downward
  From an eagle in his flight.

I see the lights of the village
  Gleam through the rain and the mist,
And a feeling of sadness comes o'er me,
  That my soul cannot resist:

A feeling of sadness and longing,
  That is not akin to pain,
And resembles sorrow only
  As the mist resembles the rain.

Come read to me some poem,
  Some simple and heartfelt lay,
That shall soothe this restless feeling
  And banish the thoughts of day.

Not from the grand old masters,
  Not from the bards sublime,
Whose distant footsteps echo
  Through the corridors of Time.

For, like strains of martial music,
  Their mighty thoughts suggest
Life's endless toil and endeavour;
  And to-night I long for rest.

Read from some humble poet,
  Whose songs gushed from his heart,
As showers from the clouds of summer,
  Or tears from the eyelids start;

Who, through long days of labour,
  And nights devoid of ease,
Still heard in his soul the music
  Of wonderful melodies.

Such songs have power to quiet
  The restless pulse of care,
And come like the benediction
  That follows after prayer.

Then read from the treasured volume
  The poem of thy choice,
And lend to the rhyme of the poet
  The beauty of thy voice.

And the night shall be filled with music
  And the cares, that infest the day,
Shall fold their tents, like the Arabs,
  And as silently steal away.

LONGFELLOW.

To a Friend Gathering Wild Flowers.

Where thorny ramparts seem to chide
  The hand which steals the flow'ry wreath;
I've seen thee thrust the thorn aside,
  To pluck the flow'r which blush'd beneath.

And thus, Maria, as the whirl
  Of life leads on the changing hour,
Remember still the sweets to steal;
  Elude the thorn to pluck the flower.

When fortune shows a dubious sky,
  The East may smile, the West may lour;
Still to the brighter turn the eye,
  Elude the thorn to pluck the flower;

In pity to its child below,
  If Heaven the cup of comfort sour,
The lesson learn, but ease the woe:
  Elude the thorn to pluck the flower.

But there—ah, shun the sweets which grow
  Where pleasure paints her poison'd bowers;
Dark are the streams, which gently flow,
  And rude the thorns which guard her flowers

And seek thy sweets on holier ground,
  And where Religion's altars rise:
Her's are the thorns which never wound,
  And her's the flower which never dies.

A World of Love at Home.

BY J. J. REYNOLDS.

The earth hath treasures fair and bright,
  Deep buried in her caves;
And ocean hideth many a gem
  With her blue, curling waves;
Yet not within her bosom dark,
  Or 'neath the dashing foam,
Lies there a treasure equaling
  A world of love at home.

True, sterling happiness and joy
  Are not with gold allied;
Nor can it yield a pleasure like
  A merry fireside.
I envy not the man who dwells,
  In stately hall or dome,
If mid his splendor he hath not
  A world of love at home.

The friends whom time has proved sincere,
  'Tis they alone can bring
A sure relief to hearts that droop
  'Neath sorrow's heavy wing.
Though care and trouble may be mine,
  As down life's path I roam,
I'll heed them not while still I have
  A world of love at home.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

VOL. XIX. RICHMOND, VA., OCTOBER, 1859. No. 10.

Professor Campbell on Vegetable Physiology, &c.

We have been kindly permited to transfer to the pages of our journal, from Professor Campbell's admirable "Manual of Scientific and Practical Agriculture," the two chapters on "Vegetable Physiology," and the "Organs of Plants," accompanied by the author's illustrative engravings. We hope this specimen of his concise, yet lucid and thorough treatment of his subject, will awaken in the reader the desire of owning the book, and of appropriating to his own advantage the whole of its invaluable contents.—[EDITOR.

VEGETABLE PHYSIOLOGY.

Plants and *animals* constitute the two great departments of organic nature. They all consist of those organs necessary to sustain life, to promote growth, and to reproduce their own species. Plants, as well as animals, are endowed with *vitality;* but they differ from animals in not possessing *sensation.* In some plants there seem to be some evidences of sensation, as in the sensitive plant (*Mimosa*); and it may be that all plants have some kind of sensation, which is so obscure as not to be ordinarily perceptible. Still we generally regard plants as destitute of this property.

BOTANY *is the science of plants.* It gives us a knowledge of their names, classification, structure, the functions of their various organs, and the uses to which they are applied.

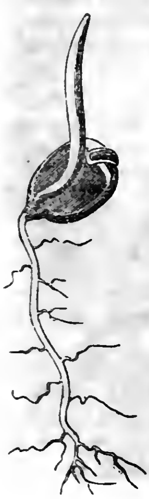
VEGETABLE PHYSIOLOGY is that department of Botany which treats of the organs of plants—their structure, and the part they severally perform in promoting life and reproduction. A distinction is drawn between vegetable Anatomy and Physiology; the former treating of the *structure* of the organs, and the latter of their *functions.* But we shall embrace both of these in the term *Physiology.* An intelligent view of this subject is of high importance to every one engaged in the cultivation of the soil.

Skilful cultivation always increases the productiveness of plants; and in many cases, improves their quality to such an extent as to render what was once worthless, now highly valuable. The apple, the potato, and the tomato, are examples of plants reclaimed from a wild and almost worthless state, to one of the highest value and importance.

GERMINATION.—The plant is first found as an *embryo* in the seed, from which it springs. *Exp.* Place a bean in warm water, and let it remain a few hours, until it becomes swollen. Then separate the two lobes of which it is formed, and you will discover, near what is called the "eye" of the bean, the embryo, consisting of two parts, one to be developed into roots, and the other into the stalk and leaves of the plant.

When a seed is placed in a moist, warm soil, it soon begins to absorb water, and also oxygen from the air mingled with the soil. A chemical change begins at once within the seed, by which the material of the grain is so modified as to become the food of the embryo plant. Seeds consist chiefly of starch and gluten; but these being insoluble, cannot be taken up by the germ in their present form. Under the combined influence of air, water, and heat, the gluten becomes *diastase*, and begins to act as a ferment; and, under its influence, the starch is soon converted into dextrine, and then into sugar. Being thus rendered soluble, it enters the circulation of the embryo, which begins to expand, and soon bursts the seed. It "sprouts," sending forth two branches, one of which turns downward, and puts forth roots; this is called the *radicle*. The other turns upward to seek the light and air; this is the *plumule*, and is soon developed into the stalk and leaves. *Exp.* Put grains of corn into several cups or bowls filled with fine soil, and place them in a warm place for three or four days, keeping the soil moist. At the end of this time examine one of them, and observe the change the grain has undergone. Then examine one on each successive day, and you will see the *radicle* and *plumule* in their various degrees of developopment, until the one becomes roots, and the other rises to the surface, and sends forth a green blade. Meanwhile the grain has been consumed, and will soon disappear entirely; the plant being now able to get nourishment from the soil through its roots, and from the air through its blades or leaves, no longer requires the store of nourishment which an all-wise Providence had laid up for its infancy. Fig. 30 will give some idea of the appearance of a grain of Indian corn, in one of its stages of germination.

FIG. 30.



The covering of the seed is called the *integument* (the *bran*); and the starchy part within the integuments, and surrounding the embryo, is known as the *albumen*. The albumen and integuments together form what is called the *cotyledon*, or seed-lobe. When a seed consists of only one lobe or cotyledon, the plant producing it is said to be *monocotyledonous:* Indian corn is an example of a monocotyledonous plant. If the seed has two lobes, as the bean, the plant is *dicotyledonous*.

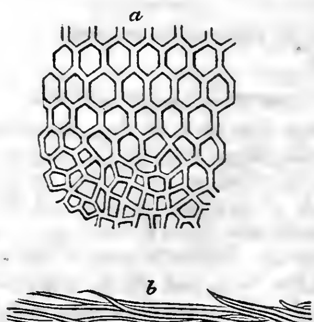
The stems of plants whose seeds have only one cotyledon, increase in size by *internal growth*. Such plants are called *Endogens*. The dicotyledonous plants, on the other hand, generally grow by the formation of new layers on the *outer* part of the stem, and immediately beneath the bark. They are hence called *Exogens*. The *grasses* (including wheat, corn, etc.), the *palms*, and plants generally having the veins of their leaves parallel, are endogens. Beans, peas, and the trees and shrubs of our forests, are exogens.

TISSUES OF PLANTS.—The various organs of plants are composed chiefly of several kinds of structure, called *tissues*. These are made up of *fibres* or *membranes*, or both together.

There are five kinds of tissue: 1. *Cellular tissue;* 2. *Woody tissue;* 3. *Vascular tissue;* 4. *Vasiform tissue;* 5. *Laticiferous tissue.*

Cellular tissue is composed of minute cells, resting upon and pressing against each other, so that the sides where they meet become

FIG. 31.



flattened, and give to the cell a somewhat regular form. Fig. 31 (*a*) is a section of cellular tissue from pith of elder, as viewed with the microscope.

Woody tissue has a fibrous structure—the fibres being in the form of slender tubes overlapping each other at their extremities, as in Fig. 31 (*b*). It is this structure which gives strength to wood, and the various kinds of fibrous material used in the arts, such as flax, hemp, cotton, etc.

The vascular tissue resembles the woody in external form, but differs in having a long slender fibre coiled within it from end to end.

The vasiform tissue consists of tubes much larger than those of the woody fibre. These tubes may be seen in a cross-section of oak-wood. It is chiefly through these that the sap passes in ascending from the roots to the leaves.

Laticiferous tissue consists of very small tubes and cells, found most abundantly in the bark and leaves. After the sap has been prepared in the leaf for nourishing the plant, it is called *latex*. Those vessels of the leaf in which this preparation or elaboration goes on, and those which afterwards convey the latex to the part of the plant to be nourished by it, are formed of the laticiferous (latex) *tissue*.

These various kinds of tissue hold and transmit the fluids of the plant, the different tubes and cells having no communication with each other, except through minute pores. These vessels are sometimes charged with liquid matter, and sometimes with gases.

Let us now examine the structure and functions of the various organs so beautifully constructed out of these several forms of tissue.

ORGANS OF PLANTS.

The chief organs of the plant are the *Bark*, *Root*, *Stem*, *Leaf*, and *Flower*.

Bark.—The bark is the external covering of the plant; and, in the widest sense, may be regarded as enveloping every other part of it, except the extremities of the roots, and the stigma of the flower. It consists of *three layers*. The *outer* one, called the *Epidermis*, is a thin, and often transparent integument, which covers every part of the plant, with the exceptions above mentioned. It may be easily separated from the surface of the leaves and green stems of many plants. On trees of many years growth, it becomes thick and rough, forming an uneven, scaly surface. The *inner* layer of the bark, which is in contact with the surface of the wood, is called the *liber*. It is generally thin, and often strong enough to serve many valuable purposes of art. The ancients used it as we use paper (hence, *liber*, a book); while in more modern times it has been used in the manufacture of mats, and of cloth of various qualities, from the coarsest coffee-sack to the finest Irish linen. Between the epidermis and liber is the *cellular integument*, which in many trees is quite thick. In the bark of the cork-tree (*Quercus suber*,) it forms the material of which corks are made.

The epidermis and cellular integument are both composed chiefly of cellular tissue. The liber consists of cellular and woody tissues.

There are little openings in the epidermis, called *stomata* (mouths). These are very minute, requiring the aid of the microscope to see them. They are most numerous on the surface of the leaves, and on parts of the plant of recent growth. These stomata perform important offices, which will be discussed in connection with the leaves.

Glands are minute masses of cellular tissue, of various forms, and situated in different parts of the plant. Their office is to elaborate and discharge the peculiar secretions of the plant. The gums, oils, &c., are secreted by glands.

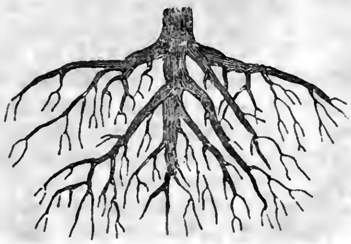
Hairs, stings, and prickles, are protuberances of the epidermis, or of the cellular integuments, covered by the epidermis.

ROOTS.

The roots serve the double purpose of sustaining the plant in its proper position, and of absorbing from the soil appropriate nourishment. Their office is somewhat similar to that of the mouths of animals. They take in both food and water.

Variety of forms.—Roots have a great variety of form, but we have room to notice only a few of the most common and conspicuous varieties. (1.) The *ramose*, or

FIG. 32, *a*.

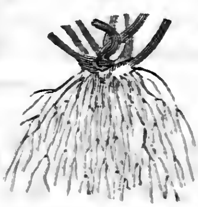


branching root, is one which sends off branches of various size in every direction. It is the kind of root common to all trees and shrubs. (See Fig. 32, *a*). (2). *The spindle root* tapers from the top downward, often branching near the lower end. It sends off little branches, or rootlets, all along the sides. We have examples of this form in the radish and parsnip (Fig. 32, *b*).

Fig. 32, *b*.

The *turnip*, or *napiform root*, differs from the spindle root, only in swelling out considerably, just at the surface of the ground. (3.) *The tuberous root* consists of fleshy masses connected together by fibres. It closely resembles the potato, which was formerly regarded as a tuberous *root;* but the proper tuberous root has no buds (eyes), while the potato has, and it is, therefore, classed with underground *stems.* (4.) *The fibrous root* is one which consists of numerous thread-like divisions, or fibres, extending out from a common head near the base of the plant. Wheat, corn, and most of the other grasses have fibrous roots (Fig. 32, *c*). Other varieties we cannot now stop to notice. The student should collect the different varieties of roots, and wash them carefully, so as to preserve every part unbroken, that he may become familiar with them as they actually grow.

Fig. 32, *c*.



Floating, or *aquatic roots*, are such as belong to plants which float upon the surface of water, without having any connection with the soil.

Aerial roots are such as shoot forth in the air. (1.) Sometimes they remain suspended in the air, without attaching themselves to any other substance, except so far as may be necessary to sustain the plant to which they belong. Their office, then, is to absorb nourishment from the air, and the rain which falls upon them. Of such plants are the pendent mosses, which festoon the trees so remarkably in some of our Southern States. (2.) They sometimes attach themselves to the bark, and even penetrate the tissues of other plants, from which they get their nourishment. The mistletoe is an example of such beggar-plants. They are aptly called *"parasites."* (3.) The roots which shoot forth from the joints of some prostrate plants, as the tomato, are regarded as aerial roots, but these soon panetrate the soil. (4.) Another variety of aerial roots are such as spring from the stems of erect plants, at some distance above the surface of the ground, and extending downward into the earth, stand like a circular row of *braces* around the base of the stalk. We have a beautiful example of this kind of root in the Indian corn, when growing on a good soil. These are often called *brace-roots.* They serve to support the plant, and prevent its being prostrated by winds; and, at the same time, collect nourishment from the soil.

Parts of the root.—Whatever may be the shape of the root, it generally has several distinct parts worthy of notice:

(1.) The *Caudex* is the main body of the root, generally descending vertically into the soil. It is frequently called the *tap-root.*

(2.) The *Fibrils* are the branches sent off from the caudex, often passing into many sub-divisions.

(3.) *Spongioles* are the soft, pulpy points of the fibrils, through which the plant gets its nourishment from the soil in a liquid form.

Structure.—The root has a structure similar to that of the stem to which it belongs. The bark of the root is more soft and spongy than the bark of the stem. Its epidermis terminates near the spongioles, leaving them uncovered. The fibrils are composed chiefly of vasiform tissue, covered with the epidermis. The extremities of the fibrils consist of this vasiform tissue in very soft and delicate form, spongy in structure, and hence called "spongioles."

Functions of the Root.—These have several times been alluded to. The *first* is the mechanical office of *attaching the plant to the soil, and keeping it in its proper position.* The *second* is the *absorption of food and moisture* from the soil.

THE STEM.

The stem originates in the plumule. The ascending of the plumule and descending of the radicle, seem to be owing chiefly to the mysterious influence of light. When seeds are planted in a box of soil, with a few stalks of hay or a little moss spread over it, and then some narrow strips of wood placed over all, so that the contents of the box will not fall out when it is inverted; and the box then turned with its open side downwards, over a mirror, a bright surface of tin, or even over white paper, so that the light will reach the soil only from below: the seeds will germinate, and the plumule *descend* towards the light, whilst the radicle will *ascend* into the dark soil above it.

Stems are *aerial* when they grow above the surface of the ground, and *subterranean* when they grow beneath the surface. *Erect* stems continue to grow in a vertical direction. *Creeping* and *trailing* stems are such as grow along the surface of the ground. Many of these have *tendrils* (coiling fibres) by which they sustain themselves on the branches of other plants; as we see in the grape-vine.

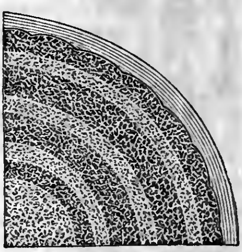
Subterranean stems generally grow just below the surface of the soil. They are distinguished from roots in having buds, from which aerial or other subterranean branches may be sent forth. The roots of many plants have the power of developing buds, and thus sending up "shoots" from their surface; but still *buds* are the chief mark of distinction between roots and stems.

Forms.—Some of the most general forms of subterranean roots are: (1) The *tuber*, a familiar example of which we have in the potato. Its buds (eyes) are the germs of new stems, to be developed the next year. (2) The *bulb*, which consists of concentric layers surrounding one or more germs or buds, from which stems spring up, developing new bulbs at their base during the succeeding season of growth. Examples—the tulip and onion.

Stems are further distinguished by the terms *ligneous* and *herbaceous*. A *ligneous stem* is one which has a woody structure, such as we see in ordinary trees and shrubs; and is composed of *pith*, *wood*, and *bark*. An *herbaceous stem* is composed of tissues similar to those of the ligneous stem (the cellular predominating), but less compact, softer, usually of a single year's growth, and without the distinctions of pith, wood, and bark. Ligneous stems are usually distinguished, in temperate climates, by concentric layers of wood, marking the annual growth, and thus enabling us to determine the age of the tree. Herbaceous stems usually grow but one season: in many cases coming to maturity and dying with the ripening of the seed.

Physical Structure of Exogens.—The exogens (outside growers), when they first spring from the seed) and also branches, during their first year's growth), have a soft, spongy centre of cellular tissue, called *pith*. This is covered with a thin layer of vascular tissue, having its spiral vessels connected with the leaves, and called the *medullary sheeth*. Surrounding this is the *bark*. Such is the structure of the infant plant; but this condition lasts but a short time. The sap, carried up by the pith, and elaborated in the leaves, descends through the vessels of the liber, and soon forms a layer of wood around the medullary sheath. This layer consists, first, of *ducts* or sap-tubes, formed during the early part of the season; then of a more compact layer of woody and vassiform tissue. Such a layer is added every year, giving to a cross-section of oak or ash an appearance similar to that represented in Fig. 33.

Fig. 33.



The pith soon ceases to be the channel through which the sap ascends—the newly-formed ducts performing this office. Again the layers of wood become gradually hard, the sap-tubes partially obstructed by the deposition of matter, which gives a reddish or brown color to the wood, and the sap ceases to ascend through them. They then form the red-wood, called the *duramen*, on account of its compactness and strength. For several years the newly-formed layers continue to circulate the sap, and retain their light color; they form the *alburnum* (white-wood—sap-wood). The *duramen* is the most valuable portion of the tree, on account of its strength and durability. The *alburnum* is softer, and decays readily, on account of the albuminous matter present in it.

Passing from the centre of the trunk or stem to the bark, and cutting the annual layers at right angles, are many plates formed of fine fibres. These are called the *medullary rays*. They are conspicuous in a piece of split wood of oak or maple.

Physical Structure of Endogens.—"In the endogenous stem, there is no distinction of pith, wood, and bark; nor does a cross section exhibit any concentric arrangement of annual layers. It is composed of the same tissues and vessels as that of the exogen; that is, of cellular tissue, woody fibre, spiral vessels, and ducts—the first existing equally in all parts of the stem, and the rest imbedded in it in the form of bundles. Each bundle consists of one or more ducts, with spiral vessels adjoining their *inner* side next the centre of the stem, and woody fibres on their outer side, as in the exogens."—*Wood's Botany.*

Most of the endogenous herbaceous stems are hollow, and have hard joints at nearly regular intervals. A bladed leaf is usually attached at each one of these joints. The joints give strength to the stem. Examples are seen in many of the grasses. Some stalks, like those of the Indian corn, are jointed, but not hollow.

Functions of the Stem.—These are, *first,* to convey the sap from the roots to the leaves, where it is prepared for the nutition of the plant, and thence to carry it to the various parts to be nourished by it; *secondly,* to sustain the leaves, flowers, and fruit, so as to expose them properly to the action of air and light. Where it is necessary that a very large surface of leaf should be exposed, the plant is constructed with numerous branches, forming a spreading top, such as we see on trees generally. In a tree, that part of the stem below the branches is called the *trunk.* The trunk is the most valuable part of those trees used for timber.

THE LEAF.

Buds.—Plants have two kinds of buds: (1) *The leaf-buds,* the first of which is the plumule as it bursts from the seed. This is developed into the stalk and leaves, and is itself perpetually renewed on the summit of the stalk. Just above the base of each leaf, a new bud makes its appearance; and in ligneous plants it is subsequently developed into leaves alone, or into a branch and leaves. (2) The *flower-bud,* which has a different structure, generally having enveloped within it the germs of both leaves and flowers.

In the cold climates, buds are protected in winter by a scaly covering, which opens and frequently drops off soon after the bud begins to swell and grow in the spring.

The leaf combines, in a striking manner, the useful and beautiful, in its structure and color. The almost countless shapes, from the straight and slender blade of grass to the deeply lobed oak leaf and the broad palm, present to the eye a wonderful variety of Nature's most delicate handiwork. The *green color,* the most pleasant to the eye, seems to have been provided by a kind Providence to soften the bright glare of the summer's sun, and thus to promote the comfort of his creatures.

To the plant itself the leaf bears the most important relation. It is the breathing organ of the plant—its *lungs.* It is the *digestive* organ, too—its *stomach.*

Structure.—The leaf consists of several parts worthy of distinct notice. The *leaf-stem,* or that by which it is attached to the branch or stalk to which it belongs, is called the "*Petiole.*" Some leaves have no petiole, but are connected by their base directly with the branch or stem. They are then said to be *Sessile.* The broad expansion of the leaf is called the "blade." The framework consists of numerous *veins* and *veinlets.* The *mid-vein* is the extension of the petiole, running through the centre of the leaf. The other veins either branch off from the base of the mid-vein, or run parallel with it. The branches of the veins are called *veinlets.*

A leaf is said to be (1) "*Net-veined,*" when the veinlets so intersect and cross one another as to form a sort of net-work. The leaves of exogens, such as our forest trees, peas, beans, &c., are net-veined; (2) "*Parallel-veined,*" when the veins run parallel with the mid-vein, and the veinlets parallel with one another, as in grasses, and most of the endogens; (3) "*Fork-veined,*" when the veins and veinlets are *forked* as in the fern leaf.

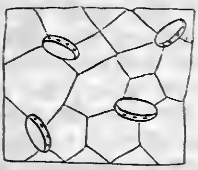
Forms.—The form of the leaf is determined by the direction and extent of the veins and veinlets, and the development of the intervening tissue. It may be *orbicular,* round; *ovate,* egg-shaped; *cordate,* heart-shaped; *lanceolate,* lance-shaped, etc., according as the outline of the framework assumes one or other of these imitative forms.

Physiology of the Leaf.—The veins and veinlets may be regarded as a prolongation of the medullary sheath, and are composed of the *woody* and *vascular tissues.* The thin, membranous part of the leaf, or *lamina,* is formed of *cellular tissue,* and generally consists of two layers; that which forms the upper side of the leaf differing somewhat in structure from that which forms the lower side. In some cases the plane of the leaf is nearly or quite vertical when in its natural position. In such cases, both sides being equally exposed to light, have the same structure.

The cells, which abound in the lamina, have their inner surface lined with little green globules of *chlorophyll,* which give the green color to the leaf. The different *shades of green* are produced by the greater or less compactness of the cellular tissue, and consequent compactness of the chlorophyll (leaf-green.)

Every part of the leaf is enveloped in the *epidermis.* Beneath the epidermis, and among the cells, we may find many open spaces, especially near the lower surface of the leaf. These are called *air-chambers,* and have communication with the air through openings (stomata) in the epidermis, which are too small to be seen with the naked eye, but with the aid of a powerful microscope, they may be seen in great numbers. Fig. 34 represents a magnified view of some of the stomata as seen in the leaf of the lily. They are so numerous on most leaves, that many thousands of them are embraced within the space of a single square inch of surface. The stomata are chiefly confined to the lower surface of the leaf; but in leaves whose natural position is vertical, exposing each side alike to the sun, they are found on both sides.

Fig. 34.



FUNCTIONS OF THE LEAF.

When the sap ascends from the root to the leaf, it carries with it in solution a portion of the material necessary for the nourishment of the growing plant. But this nourishment is still in a crude form, and too dilute to be adapted to the purposes for which it is designed. It must, therefore, undergo certain modifications. These take place chiefly in the leaves, as described in the next three sections.

Exhalation.—The sap must be condensed; that is, the surplus moisture must be thrown off. This takes place through the stomata, and is similar to the *perspiration* of animals. It is generally called "*exhalation,*" and occurs chiefly under the influence of light, and to a great extent independent of *temperature.* The stomata are *open* in the *light,* and *closed* in the *dark;* but the direct rays of the sun are unfavorable to their action.

Respiration.—Plants derive a large proportion of their nourishment from the air, through their leaves, in the form of carbonic acid gas. They also absorb small quantities of oxygen from the air, but throw off a much larger quantity into the air. This inhalation of carbonic gas, and exhalation of oxygen, we shall call "*respiration.*" In one respect it is the reverse of respiration in animals, inasmuch as animals inhale oxygen and exhale carbonic gas. The respiration of plants goes on chiefly by day, the stomata being opened under the influence of light. As the carbonic gas enters the leaf, it is at once dissolved by the sap, and carried through the circulating vessels of the leaf, where it is decomposed, its carbon being retained, and its oxygen thrown back into the air.

Digestion.—The food taken up by the roots, and carried by the sap to the leaves, there meets with the gaseous food from the air, all together forming, by their solution, "crude sap." This is generally modified during its circulation through the leaf, if an abundant supply of light be present. The changes which the plant-food thus undergoes, we call "digestion," because of its resemblance to the changes produced on animal food by animal digestion. When the sap has thus been prepared for nourishing the plant, it is called "*latex,*" *or true sap.* It is then conveyed by the circulating organs to the various portions of the plant, and in some mysterious way, under the guiding finger of Omnipotence, assumes various forms of organic structure, producing stems and leaves, flowers and fruits. Here we have a beautiful analogy between the circulation of sap in plants, and the circulation of blood in animals.

FLOWERS AND FRUIT.

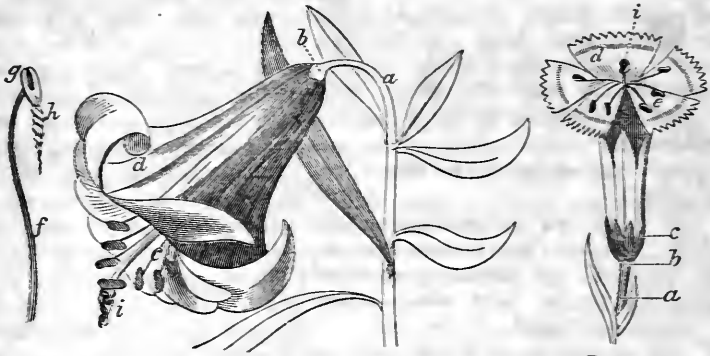
Growth, decay, and death, mark the history of every individual upon our globe, whether plant or animal. If, then, organized beings possessed not the power of reproduction, our world would soon become a bleak and barren waste. But the Creator has wisely ordained that the earth shall bring forth "grass, and herb yielding *seed after his kind*, and the tree yielding fruit, whose seed was in itself, after his kind."

Reproductive Organs.—The reproductive organs of plants are found in the flower, which is the expansion of the *flower-bud*. These, by their combined influence, bring the seed to maturity, and thus produce the embryo of a new plant.

Structure of the Flower.—As a general rule, flowers have several distinct organs or parts worthy of note:

(1.) Many flowers are attached to the plant by a stem, called the "flower-stalk" (Fig. 35, *a*). When the flower rests upon the stem, or branch of the plant, without a flower stalk, it is said to be "sessile."

Fig. 35.



Stamen. Lily. Pink.

(2.) The head or top of the flower-stalk on which the other organs rest, and to which they are usually attached, is called the receptacle" (*b*).

(3.) The calyx is the external *cup* which surrounds the flower at its base. It is generally *green*, but sometimes colored like the other parts of the flower. It is sometimes in one entire piece, having its edge notched. At other times it consists of a whorl of separate leaves. These divisions of the calyx are called "sepals" (*c*).

(4.) The delicate and beautifully colored circle of leaves, forming the inner coating of the flower, is the "corolla." Its divisions are called "petals" (*d*).

(5.) The "stamens" are the slender organs of thread-like structure, situated within the corolla, and generally (though not always) equal to the petals in number (*e*.)

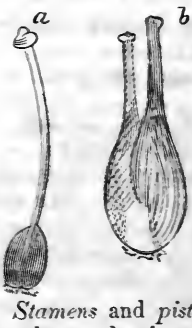
The three divisions of a stamen are: the *filament*, or slender stem; the *anther*, which is a little two-lobed organ at the extremity of the filament; and the *pollen*, or fine yellow dust found in the anther. The pollen, when viewed with a microscope, is found to consist of minute membranous sacks filled with a fluid substance (Fig. 35, *f. g. h.*)

(6.) Within the circle of stamens are the "pistils.' These occupy the centre of the flower. Some flowers have but one pistil, others have a great many (Fig. 35, *i*),

The pistil has three divisions: *ovary*, which is the enlarged part of the pistil at its base, and contains the germs of the future seeds; the *style*, the slender part of the pistil rising above the ovary; the *stigma* is the top of the pistil, and usually consists of one or more rounded lobes.

The ovary is often *simple*, consisting of a single cell, or *carpel*; but more frequently it is *compound*, having two or more carpels. When the ovary is simple, it has but one style and stigma; when compound, it has a style and stigma for each carpel; unless the style is wanting, as sometimes happens. In that case, the stigma rests upon the ovary, and has one division for each carpel. (Fig. 36, *a*, shows a simple pistil with its different parts; *b*, one of compound form.)

Fig. 36.



Stamens and *pistils* are essential organs for the production of seed in any plant. But they are not always found in the same flower. (1.) They often *grow in different flowers upon the same stalk*. In such cases, the flowers containing the stamens are called "staminate," and those containing the pistils are called "pistilate." For example, Indian corn has its stamens in the *tassel*, and its pistils in the *ear-shoot*. The tassel then is the staminate flower, while the shoot, with its silk, forms the pistilate flower; the tassel, with its beautiful, pendulous stamens, and the shoot with its fine glossy silk, present interesting objects of study. (2.) *The staminate and pistilate flowers sometimes grow on separate plants.* Of this we have an example in common *hemp*. A little examination will enable the student to distinguish between the staminate and pistilate plant. The staminate is barren—the pistilate produces seed.

FUNCTIONS OF THE FLOWER.

The corolla is the breathing organ of the flower; but, unlike the leaf, it absorbs large quantities of oxygen, and exhales corresponding quantities of carbonic gas. The same process is carried on to some extent by the stamens and pistils.

The end to be accomplished by the stamens and pistils, is to fertilize the seed. Pollen is produced in the anthers; and by them is so discharged at the proper season, that portions of it fall upon the stigma. The little granules of pollen then burst, and their contents are absorbed by the stigma, and carried through the style to the ovary, where they take part in the formation of the seed. If the pollen is cut off from the stigma entirely (as may be done in an isolated stalk of corn, by destroying the tassel before the silk makes its appearance), no seed can be produced. But if other tassels are near at hand to provide pollen, the stalk may produce an ear without a tassel of its own.

There are certain periods in the growth of crops, when the pollen, and even the stamens, may be beaten off by violent rains and hail, to such an extent as greatly to diminish the quantity of grain which would otherwise have been produced.*

By a wise provision of the Creator, the flower is so constructed that the pollen is readily transferred from the anther to the stigma. When the flower grows erect, like the tulip, the pistil is shorter than the stamen; and the anther rising above the stigma, readily discharges its pollen where it is wanted. So, when the flower droops, as the lily, the pistil is longer than the stamen, in order that the pollen may still fall upon the stigma, (see Fig. 35).

When the staminate and pistilate flowers are on different plants, the pollen is sometimes carried from the one to the other by the wind; sometimes by bees, and other insects.

FRUIT.—When the ovary is fully developed, it forms the *fruit*. The fruit consists of two parts: (1) The *pericarp*, which surrounds the seeds; and, (2) The seeds which contains the germs of new plants.

In the apple, peach, etc., the pericarp is the most valuable portion of the fruit. In cereal or grain crops, the seed is of chief value—the pericarp being the chaff or husk.

The seed may be divided into: (1) The *integuments* (bran), which consist of several layers forming the outer coating of the grain; (2) The *albumen*, which is the white, starchy mass within the integuments; and, (3) The *embryo*, or germ of the new plant, which is also within the integuments, and generally surrounded in part by the albumen.

The albumen constitutes the larger part of cereal grains, and serves not only as food for the embryo plant, but also constitutes a large proportion of the food of man and beast.

DURATION OF PLANTS AND THEIR ORGANS.

When a root or stem lives through only *one summer*, it is said to be *annual*. When it lives through *two*, it is said to be *biennial;* and when it lives through *three or more* it is said to be *perennial.*

The root and stem are often *both annual*, as in flax, hemp, Indian corn, cotton, and tobacco. (2) The *root* may be *biennial*, and the *stem annual.* In such cases the stem does not usually make its appearance until the second season. Examples—the common thistle and winter wheat. (3) The *root* may be *perennial*, and the *stem annual*, as in most varieties of grass. (4) *Both root and stem* may be *perennial*, as we see in trees and shrubs.

Leaves are deciduous when they die and fall at the close of summer, or as soon as the plant has reached maturity. They are *evergreen* when they endure until the new leaves of the next growth have made their appearance. It is, properly speaking, the

* The wheat crops, in the summer of 1858, were seriously damaged in some places, by the heavy rains which fell while the grain-fields were in full bloom.

plant, and *not the leaf*, which is evergreen; for the old leaves of evergreen plants, like the pine, drop off in the spring, as the new leaves come out to take their place; and thus the succession of leaves keeps the plant ever green.

Climate modifies the duration of the leaf. A plant may be ever green in a warm climate, while its leaves become deciduous when removed to a colder region.

From the Southern Farmer.

Permanent Improvement of Tobacco Land.

Mr. Editor—In the last number of the *Farmer*, a correspondent writing from Columbian Grove, Lunenburg county, requests that you or some correspondent would inform him of "the best mode of improving and keeping up tobacco land, and what kind of grass is best to use that will improve the land the most." As this is a subject of much interest to the planter, I hope we shall have the views of many in regard to the best mode of improving our lands, cultivating the soil, and producing such crops as are remunerating. Although unaccustomed to writing for agricultural papers yet I am disposed to communicate my views and experience on this subject, which, if you think worthy, you are at liberty to publish.

In order to facilitate the improvement of our lands, it is important that our farms be divided into five shifts or fields, to be cultivated somewhat after the following order; 1st year, corn and tobacco; 2nd year, wheat and oats; 3rd year, clover or other grass; 4th year, wheat on fallow, 5th year, pasture. On every farm there should be kept as many cattle as can be wintered. These should be penned regularly during the summer, taking care to move the pens as often as every 10 or 12 days, on land intended for tobacco the next year, which should be the poorest land in the field. New lots should be made every year as large as the means of manuring, or the size of the crop may require. All the manure that can be made during the winter and spring, either by hauling litter into farm pens, or composting on the land, should be applied. The land should also have an application of guano just before planting. Land thus treated will seldom fail to produce a good crop of tobacco. After the tobacco is removed, the land should be seeded in wheat, and one gallon clover seed per acre sowed and harrowed in about the first of April. If we succeed in getting a stand of clover, which we may reasonably expect, this land, which before was poor, may now be said to be permanently improved. After standing one year in clover, the land should be fallowed for wheat. We have known land thus treated, to yield from 15 to 20 bushels of wheat per acre, which before, would not have made 3 barrels of corn. On all corn land that will produce it, clover should be sowed to be fallowed as before directed. But as a general thing, clover will not grow on ordinary corn land, even after an application of guano. On such land as this, we would sow herds grass, which, when once we can get a stand, will act as a permanent improver. Land sowed either in clover or herds grass, should be grazed very little the first year. We have found the pea fallow to succeed very well, but as a general thing, it is too expensive and requires work at an unseasonable time. By pursuing the system here recommended, I think that instead of finding tobacco an impoverisher, we will find our lands improving annually. No lot land should be cultivated in tobacco more than one year, until it has gone through the regular rotation. By this means we shall be improving more land, besides adding to our wheat crop. I know that this system has objections, such as the inconvenience of having our lots so far from our buildings, the inconvenience of making and hauling manure, &c.; but I am satisfied that the benefit and advantages derived from it will more than repay us. Hoping to hear from others on this subject, I will now close this imperfect sketch, as I may, perhaps, refer to it again.

J. G. P.

Forkland, Nottoway, June 15, 1859.

Life Without Trials.

Would you wish to live without a trial? Then you would wish to die but half a man. Without trial you cannot guess at your own strength. Men do not learn to swim on a table; they must go into deep water, and buffet the surges. If you wish to understand the true character of your boys—if you would know their whole strength—of what they are capable—throw them overboard! Over with them!—and if they are worth saving, they will swim ashore of themselves.

From the Report of the Commissioner of Patents for the year 1858.

Considerations on the Causes and Effects of the Diminution of American Crops.

Notwithstanding the natural fertility of a large portion of the surface of the United States, a fertility which is acknowledged to be superior to that of any country in Europe or Asia, the average acreable product of the soil is much below that of some countries in those regions. China, for instance, which supports a population estimated at 300,000,000, or ten times that of the United States, upon a *cultivated* surface probably not three times greater than that of this country, must produce about three times as much to the acre.

France, with an area less than one-fourth that of the settled portion of our territory, has a larger population, proving that its soil produces much more than ours.

England and Scotland, the soils of which are far from being naturally of a first order of fertility, must raise enormous amounts of life sustaining products, as is exemplified by their large population.

The same might be said of Belgium, and of several other countries.

It seems to be that few questions could be more interesting to consider than to investigate the causes and possible remedies of this state of agricultural inferiority. And let me here at once remark that it is lamentable and humiliating that it should be necessary to discuss such a topic as the exhaustion of *American lands;* of lands of great natural fertility, which have not been in cultivation, on an average, for half a century, while soils, not naturally more fertile, are known to have been in culture in Europe for at least 2,000 years, and in China for a much longer period, yielding at this day, far larger returns than do our own lands which are, as it were, fresh from the creation! It is my belief that the main cause of our inferior production is to be found in the sparseness of the population. There are undoubtedly several others, but they are nearly all more or less dependent upon this first and principal cause. I would add that as the population of the United States is increasing at a ratio probably unprecedented in the history of man in so extended an area, we have every reason to hope that the evil is constantly and rapidly being corrected.

As long as there shall remain vast tracts of unoccupied virgin soil, of exceeding fertility, to be had for a low price, so long must agriculture be carried on in a loose and careless manner, particularly in the neighborhood of those lands. If this be denied to be the cause, we must ascribe the fact to other influences; but what other cause shall we name? The fertility of American soil is proverbial, and we therefore cannot look for the deficiency in that direction. Neither can we ascribe it to the climate, for although our winters are severe at the North, yet our summers are genial, and sunshine and rain fall upon the land, and forward the growth of plants as beneficently here as in any other section of the earth. Nor can we find the cause in our political institutions, for they are acknowledged to be as paternal and as liberal as any ever devised for the welfare and happiness of man. Neither can it be found in our religious institutions, for I believe no other people are so free in this respect as those of the United States. Nor yet in exorbitant and discouraging taxation; in this particular we are more favored than those nations which surpass us in the comparative amounts of their products. It is thought by some that one great reason is to be found in the absence of sufficient protection to American industry, and the consequent tendency of too great a proportion of our people, who otherwise would pursue other employments, to seek their support in the cultivation of the soil. There may be something in this, and it may be one of the causes, but yet I do not think it the greatest; for, suppose the population of this country to be proportionately as large as that of France or of England, every one at once perceives that then the tariff question would only be important as affording means to keep the governmental machinery in motion, and could not have a very serious bearing upon the agricultural production of the country. As it is, however, that question is undoubtedly important to us, until our population shall become thus large. Among other reasons, one is that the most profitable farming combines various kinds of produce, many of which are of such character that they must be consumed at or near home, as they will not, by their intrinsic value as compared to bulk and weight, bear transportation to any great distance, or cannot safely bear transportation at all. In either class would be found many of the articles which help to make up the farmer's profits, such as eggs, poultry, milk, butter, hay, all the articles comprehended by the general name of *vegetables*, tender fruits and several kinds of grain, which it is here unnecessary to enumerate. These never pay unless there is a demand for them at or near the place where they are produced. Without such a demand, it is unprofitable to cultivate these articles at all. Thus we are debarred from growing the very articles which would be least exhausting to our lands.

Probably the worst effects of our system of exchange of products, with few exceptions, with other nations upon the agriculture of this country is, that in return for their goods, which have great value in a small bulk, we annually send to them thousands of tons of highly fertilizing elements which a wise system would require to be returned to the land for repeated production.* Other nations, England especially, imports, at great cost, guano and other fertilizers, the expenditure for which is well repaid; while we, boasting the richness of our so-called inexhaustible lands, are blindly shipping away a constant stream of the most concentrated and valuable manures in the form of cotton, tobacco, wheat and Indian corn; and while they, with sedulous care, are constantly making their naturally poor lands richer, we are every year rending our rich lands poorer.

However large may be the individual profits accruing from such a foreign commerce, the nation must be a looser; for, agriculturally speaking, other nations are constantly adding to their capital, while we are surely, and more rapidly than is generally believed, growing poorer and poorer—we reap the shadow, they harvest the substance.

I have said that the main reason of our agricultural inferiority was to be found in the sparseness of our population. Now, it is evident that if the density of that population were three or four times greater, or even six times, as will eventually be the case, the home demand would absorb a much larger proportion of the agricultural products of our land, if not the whole of them, and the exhausting tendency of our foreign commerce would then be obviated, or least greatly lessened. And here we may observe that the most populous countries of the globe never export breadstuffs or other agricultural produce to any great extent, but rather import them, their exports consisting mostly of manufactured articles, in great part derived from the bowels of the earth, or, if produced by agriculture, the greater part of their value being conferred by mechanical labor.

The Western States have few manufacturing establishments, certainly not sufficient to consume any considerable portion of the surplus of Cereals and other provisions; consequently, they have no home demand, as in populous manufacturing districts. A large portion generally remains after supplying the domestic consumption, which must seek distant markets; the greater part of which goes to Europe and other foreign parts. Agricultural produce is bulky, and cannot be transported four or five thousand miles, partly inland, without reducing its value to a comparatively low price where it is raised. This is one of the principal causes of the present depressed state of the agricultural interest in the West; and as long as this cause remains active, so long will there be a lack of inducement for Western farmers to make the earth yield supplies to its utmost capacity. At the same time that the want of home markets keeps the price of Western produce down, (except when European crops are short,) the cheapness of Western lands prevents the wages of labor being lowered to a price corresponding with that of agricultural commodities; for when laborers do not receive sufficient wages for their services, there is to them a remedy in the public lands, from which they can pre-empt a farm upon one year's credit, or, if they have savings, they can at once purchase homesteads. This state of things, happy as it undoubtedly is in one sense, by giving facility to the poor man to secure a farm, has, however, this bad effect upon the agricultural improvement and thorough culture of the soil, that, by keeping the price of labor at a higher point than the productive value of that la-

* The amount of breadstuffs of all kinds, exclusive of rice and potatoes, imported and exported from the United States during the fiscal year ending June 30, 1858, are as follows:

Foreign imports free of duties.....	$5,395,933
Foreign imports paying duties ad-valorem..........	95,964
Total imports....	5,491,897
Domestic exports..........	33,698,490
Foreign exports...................	21,517
Total exports...................	33,720,007
Excess of exports........	28,228,110

bor warrants, it causes the farmer to cultivate a large surface of land as cheaply and rapidly as possible, rather than a smaller surface in a slow and thorough manner; the interest on the capital invested in the land on which the crops are raised being comparatively a secondary consideration, for the cost of the produce is almost entirely made up of the labor expended in producing it.

In densely-populated countries this order of things is reversed. There the land is so extensive that it seldom yields more than 3 per cent. upon its cost, while the wages of lacare low on account of its superabundance. Therefore, the land owner must, from necessity, maintain the fertility of his fields by exacting for them the most complete culture and the highest manuring, which he is enabled to do by the cheapness of labor and the high price he can almost invariably obtain for his products.

I have said that the American farmer is compelled to cultivate as large a surface as he can. This necessity is attended with another evil, which greatly detracts from the general production, namely, the scarcity of laborers at harvest-time, which often makes it impracticable for him to secure his grain or hay as well as he would, had he abundant labor at his command. Our harvest-fields are frequently made, from necessity, a sort of race-course, where every man strives with his neighbor to reap or bind fast, regardless of the large proportion of grain, sometimes amounting to one-eighth, or even more, of the whole crop, which is wasted or lost. In Europe, everything is saved, mostly by the farmer, but also by the poor people and children who glean every ear which has escaped his careful gathering. Our comparative deficiency of production is made to appear, by this cause, even larger than the reality. Another consequence of the scarcity of labor is, that, in general, our lands, not being so well prepared for the reception of seed, a greater amount is required; making probably a difference of half a bushel of wheat per acre. This, trifling as it may seem, must make a difference of at least 3,000,000 bushels in the aggregate production of the United States. Much more seed might be saved by the use of drilling machines, which, leaving the grain at equal distances in the ground, will seed it sufficiently, and better than could be done by hand, with about one-quarter of the amount usually put in. Such machines are deserving of all favor, when we reflect that their use largely enhances the crop, and that seed wheat absorbs every year about one-eighth of the produce of the preceding season. Their general introduction would probably save 12,000,000 bushels of wheat annually, which, being already earned, and passed contingencies of seasons or other risks, would represent at least 18,000,000 of bushels in prospect.

In the United States, we have decidedly better harvesting weather than they have in Western Europe, yet, for want of sufficient help, with large amounts of grain and of hay exposed to storms, a much greater proportion is injured or destroyed from wet here than there. Many million bushels of grain are yearly lost in the United States from this single cause. However, the recent introduction of reaping machines, which save the grain as perfectly as could be done with the most careful hand-labor, and at far less expense, is doing much to remedy some of these evils; where the nature of the land is such that they can be used; that is, where neither stumps nor stones stand in the way. These machines performing with five or six men as much work as double that number could do without them, have the effect of making laborers more abundant at harvest-time.

Another injurious consequence of a sparse population is an excess of birds and wild animals, which prey upon the husbandman's crops, fruit, poultry and stock.

Generally, American farms are undoubtedly too large, especially at the West, for them to receive the high culture required for their production of so large a yield to the acre as they are able to produce. Too much is attempted, to be done thoroughly. Manure collection and the preparation of composts are not so much attended to as they deserve. We rely too much upon what we are pleased to term the "inexhaustible fertility of our soil." I am told that some forty years ago, the French settlers about Detroit were in the habit of depositing the manure that accumulated about their stables, in large heaps upon the ice of the river, which was the most expeditious way of getting rid of what they deemed a nuisance. Others thought it cheaper to remove the stables themselves rather than the rich heaps which obstructed access to them. I have seen in Wisconsin what I consider a scarcely less objectionable practice, setting fire to the straw after the grain has been threshed—a practice which is still prevailing to some extent on the prairies. A more exhausting and ruinous course could hardly be imagined. The consequence cf all this is, that our lands, which, under proper management and a jndicious rotation, would be capable of yielding average crops of wheat of 25 to 35 bushels and upwards to the acre, seldom realize, one year with another, more than 14 bushels—a sad state of things, when we reflect that the average yield of naturally poor soils in England and Scotland is not less than 33 bushels.

A want of system in the distribution of the labors of the farm, and in the application of the principles or dictates of true economy, is so evident everywhere at the West, that the mere mention of the fact is sufficient to entitle it to be classified as one of the causes of our agricultural deficiency.

Everything considered, sheep are perhaps the most valuable of the domestic animals reared on our lands, on account of their little cost and large returns, and also by their improving greatly the land on which they graze. How, then, shall we qualify the fact that many of our prominent farmers have been compelled to abandon this branch of industry on accounts of the depredations of dogs and wolves? This evil demands the interference of State legislation.

Another defect in our agricultural practices is the apparent absence of a knowledge of causes and effects which generally prevails. As long as the land under tillage seems capable of producing the few articles which are raised by farmers here, mostly wheat, corn, potatoes, and oats, so long are they entrusted to the soil with the expectation that the yield will be as large as when the land possessed its original fertility; and when, as is almost sure to happen, the expectations formed are not realized, the blame is laid to the extreme dryness or moisture, to heat or cold, or perhaps to the baneful influence of the moon—to everything in fine, but the true reasons, neglect to restore to the land those elements of fertility of which the soil has been robbed by former crops, the want of sufficient tillage, and of proper ration.

In view of the rapid impoverishment of our lands, it does not require prophecy to foretell that, if the destruction of the human race is ever to take place, it will surely come by the absolute exhaustion of the elements of vegetable productiveness in that land which a beneficent Being has given us for an abode and an inheritance. It will surely come when the earth shall be barren and desolate, made so by the sordid avarice of the very men who had the mission to adorn it and make it fruitful. It will come through the *starvation* of the last descendant of Adam in the last once fruitful and smiling, then barren and desolate valley.

It would, indeed, be a singular fact, if it were true, that out of the many varieties of plants which the earth produces, only four or five could be raised with profit. In reality wheat and corn are about the only articles which are thought to be capable of profitable transportation to an Eastern market; the Western farmer, whose groceries and dry goods almost invariably come from that quarter, is obliged to raise these two staples, which nearly alone supply such an exchange. This commerce, for many causes, has a tendency to keep the Western States poor and to depress their agriculture.

In spite of these drawbacks, how much cause we have for encouragement in the present, how great reason to hope for the future! Let us but think of what has been achieved in the past—how many cities have been built——how many millions of acres have been subdued and made to contribute to the comfort and happiness of man within a single generation. Would it be reasonable, even in this fast age, to be dissatisfied with vast and valuable results—far outstripping those of any century since the creation of man—because we have failed, as yet, to equal the degree of perfection attained in countries having for their inheritance the accumulated capital and labor of centuries? Surely not. Everything cannot be done at once. Agricultural perfection is the work of time. The forest must be cleared; the stones be removed; the sod broken; the marsh improved; the swamp drained and reclaimed; buildings erected; fences built; roads opened and made passable; school-houses constructed and endowed, and agricultural science disseminated among the people.

The Annual Reports of the Patent Office and the agricultural papers throughout the Union, are doing much to promote rural industry, and make known the various defects of our practices. But they are hardly sufficient. A more permanent good could be done to the rising generation by the establishment, in every State, of an agricultural college with an experimental farm, endowed with sufficient liberality, where farming could be taught, both as a science and as a mechanical operation—where theory should be constantly confirmed by practice. In these institutions, many plants may be cultivated; native grapes, for instance, which, resisting the severity of our winters, might, by proper management, be made to produce wine with certainty, without danger of being killed by frost; an experiment worth trying, but which few individuals would undertake on a sufficiently large scale, for fear of want of success and consequent severe loss. Many other experiments might be mentioned, which, if successful, would greatly add to the wealth and comfort of the people.

It may not be out of place here to observe that the nations which thrive most by their agriculture are those that cultivate the greatest variety of products; for, when one article fails, another may succeed and make up for the deficiency. A season may be unfavorable for wheat or potatoes, and good for corn; or unsuitable for the three, and yet good for fruit, vegetables and grass. Hence the people who cultivate the greatest number of staples, have probably seldom, if ever, occasion to lament, as we sometimes do, an almost total failure of crops. At any rate, one important point would certainly be gained; that inasmuch as farmers are predisposed to follow a routine from which it is difficult to move them, their children, educated at these agricultural colleges, would work by the teachings of science or common sense, and better methods than now prevail would be certain to be speedily adopted. These institutions, with their libraries and other appendages, would remedy a great evil among us, who are, properly speaking, an agricultural people. In general, the agriculturalist is not so liberally educated as men belonging to other professions, although probably no other calling really requires such extensive and varied knowledge of the laws and secrets of Nature.

Barns and Shelter for Stock.

Mr. John Johnson writes to the *Ohio Farmer* as follows:

In traveling through your State last August and September, I seldom if ever saw a barn for grain or hay, or even a shelter for cattle. This I think very bad economy. There is a great waste of grain from letting it stand in shocks. I was told it stood thus even for months, until the farmers got time to thresh it, and then I was told they generally took the straw away from the machine by horse rakes, and left it laying in heaps on the field to rot. The hay put in barns would be a great deal more profitable to feed than when put in stacks. I think barn hay is worth one-half more than stack hay, to feed to either cattle or sheep, when put up in stacks, especially such small stacks as I saw in Ohio, the majority containing not over from two and a half to three tons. If farmers will stack their hay, why not put from ten to thirty tons in a stack, and then, if properly put up, there would be much less waste. The stacks would be more solid, and excluded from the air, which almost ruins the hay in these small stacks. If the hay was cut earlier, and put in large stacks, it would be much better; but houses for both hay and grain soon pay for their cost, which I know from experience. Then their poor cattle and sheep have no shelter in winter, but have to stand out in all storms, and often to lay in snow, with the thermometer at from twenty above to twenty below zero. This appears to me to be very unprofitable to the owners, and unmerciful to the dumb brutes. If they would erect good sheds for their sheep and cattle, and barns for their grain and hay, then they might keep their stock as it ought to be kept, and make large quantities of valuable manure, and I am much mistaken if a great deal of the land in Ohio does not now need manure nearly as much as we do here. I did not see a manure heap in Ohio, only where cattle had stood or been fed in the woods, and the manure left there to waste. I noticed, I think in the *Cincinnatus*, (which some person kindly sends me,) that large sums have of late been expended in Ohio in building churches and school-houses, which is very laudable, as a State without education and religion can never prosper; still, with the thermometer at zero and my cattle and sheep exposed to the pitiless storm, I don't think I could sit very comfortably in a church, no matter how elegant or how comfortably warmed, even while hearing the most eloquent preacher.

Every few years we read of great mortality among the cattle and sheep in Ohio, and it never will be otherwise until they are better cared for in winter. No doubt some may say, who is this that dictates to us? we know our own business; or even some may say, what right have I to judge them? I would tell them, I have long been a thinking, working farmer, and know from practice what I write about. I have for over thirty years endeavored to improve the condition of my brother farmers, and I well know that good shelter and good feeding are the only way that farmers can be remunerated by keeping stock. True, for some years past, they have brought high prices, and even if kept in bad condition they might pay, but prices have been going down for some time, and may continue to do so until they are as low as they were fourteen years ago, and then "scallawags" would not pay for taking to market. When I first began erecting sheds here for my sheep, there was nothing of the kind in the country, and gentlemen whom I looked upon as men of good judgment in many things, told me it would be money worse than wasted, as my sheep would not thrive in yards and sheds, which were not congenial to their habits. I answered that I could give them their choice; if they liked better to be out, they could go. Now you very rarely meet with a farmer any where in this State, at least where I have been, but has shelter for his sheep and cattle in winter. Only apply thought and observation, farmers, and you will soon see the necessity of shelter for both sheep and cattle. Take out some straw in a cold morning, and throw it down among your sheep and cattle, and see how they will fight for the liberty to lay on it. This must convince any man that shelter and a good bed are important.

To Prevent Rats Undermining Cellar Walls.

The stability of cellar walls is sometimes seriously affected by rats digging underneath them and thus weakening the foundation. In order to prevent such injury, after the cellar walls are completed and pointed, you must dig a small trench inside of them, about one foot wide and half a foot deep. Now fill this trench nearly full of small stones and water-lime mortar; then cover the stones and mortar with the earth taken from the trench. If thus you guard the bottom of the walls, you will find all the efforts of rats at undermining to be utterly vain; they will have to go sneaking out at the very door or hole by which they entered. Some people say that rats from the outsides dig down under the wall, and thus under the cellar; but this is a mistake. The fact is, they enter the cellar by the door or some hole, and then, if this entrance is closed against them, they dig a passage out under the wall. Such passage they cannot make if the inside trench is as described, as they always begin to dig close to the bottom of the wall; and hence, when they encounter the stones and mortar, they are disheartened and abandon the undertaking. If plank close to the wall should lie on the cellar bottom, they will commence digging at the inside edge, although it be a foot or more from the wall. If a quantity of potatoes should be piled up in the middle of the cellar, the rats will begin to dig under the pile, or even under the bottom of the chimney, perhaps instinctively expecting thus to work their way out. But to guard against their digging operations cover your cellar-bottom with a thick coating of water-lime and sand, and the saucy depredators won't trouble you any more.

[*Rural American.*

For the Southern Planter.

Rainy-Day Thoughts.

ON RAISING HORSES AND MULES.

It is a rainy day—*mirabile dictu!* The clouds that lower over our heads have been for a long, long time, "in the deep bosom of the ocean buried." The corn fields attest the withering effects of protracted drought. Welcome, thrice welcome to the farmer, is the refreshing shower. Even if too late to revive the wilted corn, it is not too late to restore to an arable condition the parched earth, and measurably to relieve the faithful horse from the sore toils of the fallow-field, always exhausting, even under the most favorable circumstances. Indeed, at this season of the year, throughout this section of Virginia, we always find our horses, for the most part, in low order. This is, to some extent, attributable to the extreme heat, and to the length of the days, but chiefly to our negligence in not providing them of sufficient size to fit them for such heavy work. For instance, of nine work-horses of my own, the largest are fat, while the small ones are all poor, and I think any observant farmer will find his own stock in the same condition. To remedy the evil, I propose that proper attention should be paid to the selection of our stock of brood mares, remembering that, by their good form and gentle disposition, they should be well adapted to breeding for heavy draught purposes, and of course, that good size, large bone, and muscular power are all important. They should not be too compact. They should have an eye of a yellowish cast of rather oblong shape, a placid countenance, and a quiet disposition. These characteristics secured, we should then have the material to build upon, and by patronizing horses of the same general character, but with sufficient compactness, we could rear such animals as would turn our soil with more uniformity, at greater depth, with more ease, and at less cost. Such a line of conduct pursued by the farmers in the Valley of Virginia and that of Pennsylvania, has given their horses a world-wide reputation for all the properties of a first class draught horse. Even the most indifferent are brought into this Piedmont country and sold at figures 20 to 50 per cent. higher than our own stock; though we have paid in many instances as high as fifty dollars for the getting of our foal, whilst the farmer in the Valley has paid a barrel of corn or perhaps (which is frequently the case,) has a stallion of his own which he uses ordinarily as one of his work-stock, and breeds from him without any expense. These are facts which should open the eyes of our own farmers to the subject. Instead of rearing colts from small mares by thorough bred horses at a cost per season of twenty-five to fifty dollars, with all the uncertainty of getting a colt, we should be regularly sending off all our small stock to a market within a sandy soil where small horses answer well the purposes of the planter or farmer, and supply their places as fast as possible with brood mares of large size.

We rear horses for profit, yet it is as strange as true, we are large contributors to the capital of Kentucky, Ohio and Pennsylvania for mules and horses. This is a tax, important in itself, and should find a corrective. We have no statistical information upon which to base a correct statement of the amount. We are, however, aware of the tax, and each farmer will find in the future, (if he does his duty,) some way to remedy this species of taxation.

With large mares put to large horses, or (which is more profitable) bred to jacks of your own raising, or buying one for your own use, and permitting him to go to but few mares, you would greatly increase the chances of getting colts and save you from the enormous tax paid to Kentucky for her most worthless mules annually sent to our market. Your colts would cost you by this system comparatively nothing. There would be almost a certainty each year of a colt with much less liability to lose the mare than in breeding colts from the horse. The size of the jack is of secondary importance, as the mule partakes more of the size of the dam than of the sire. The mule is much less subject to disease or accident than a horse; is more hardy, matures and is ready for labor much earlier, and commands at two years old, from one hundred to one hundred and fifty dollars.

For us of Piedmont to succeed in rearing mules and colts, not only for home use, but for the markets of adjoining States, is but to will it, to know no such word as can't. It can be done, and done more profitably than by the grazing of cattle at a profit of from ten to fifteen dollars per head. So let us to the work: we have commenced the breeding of sheep; our flocks are equal to any in the union for size, fleece, and health. Our cattle are of the best breeds; our hogs are far-famed for their sweet and juicy hams. The factories of this region already consume a considerable portion of our wool, and they are growing in importance every day, and that too without asking any special bounty at the hands of Congress for their fabrics. Indeed, we are equal to any enterprise, and should never halt until we rid ourselves of this very unnecessary tax levied upon us by our sister States for work-teams. We, the farmers of Piedmont, have everything to encourage us in our pathway of improvement. Let us then put, and keep the ball of enterprize in motion in every department. We have title deeds to a country between Tide-Water and the Blue Ridge replete with all that heart can desire, combining more advantages with fewer objections than any part of our blessed country. Its water is plentiful and of the purest—its health unsurpassed. Contiguous to the best markets of the Union—with an adaptation of soil to the greatest variety of products—with an educated, refined and law-abiding people, whose veneration for the Union is unsurpassed by any portion of the thirty-four States. With such blessings conferred upon us, what can Piedmont not be in a generation to come?

If her young men will first remember that improvement is the word that their education has just commenced when they step from the threshhold of college upon the great theatre of life. Let them abbreviate their moustache to a point of neatness, and use their hands about something more profitable than stroking it and twisting it into a spiral shape with a gentle turn of the digets, in order to save them from masticating this ornamental part of the animal. Let them lay aside their cigars and forget their toddy. Let them remember, a pack of cards is the devil's book—cease its study, or it will prove their ruin. If such follies may have been taught them at college, they certainly were not at home. But discarding all such follies, let them learn to handle the hay-fork and the plough-handle, not that it may be necessary to your support only, but that such labor constitutes the practical education, without which all their beautiful theories will avail nothing. So let me suggest to the young men especially, those who have been pampered in indolence and the neglect of business by indulgent parents, to lay aside their follies that they in their day and generation may add another stone to the monument already commenced, which shall commemorate the enterprise, the thriftiness and the virtue of the present generation of Piedmont. ORANGE.

For the Southern Planter.

On the Improvement of Poor Land.

Mr. Editor:

Having been for many years a farmer on a moderate scale, cultivating land generally poor—some by nature and some from a bad system—I have great interest in the improvement of our poor lands in Eastern Virginia where I reside, and with which portion of our State only am I well acquainted. Below us, our brother farmers, many of them at least, have marl in abundance, and if they do not improve their lands, it is owing to their neglect of the writings of Edmund Ruffin on Calcareous Manures. But we have no such opportunities, unless at an expense which we believe too great to be borne with regard to present or even ultimate profit. The lands in our region differ materially in quality, and are consequently affected differently by the same fertilizers, more especially by gypsum or plaster. On some parts of the same plantation its effects on clover are perceptible in a few spots in a very remarkable degree, while on other spots I have not been able to discover any noticeable effect upon vegetation. This, then, can only be partially used as a stimulant or fertilizer. Lime has been but little used in our neighbourhood. Some say they see little or no benefit arising from the small experiments made with it; others speak well of it, but think the cost, to us, is too great to be extensively used for the benefit derived from it. I have made a few experiments with it, upon a small scale, but have never been able to discover any decided benefit from it until recently, and that on a peculiar soil consisting of very light, black alluvion, coloured, no doubt, by the standing water, (stained with the leaves of trees and shrubbery,) within the basin or pond in which the soil was deposited, and for which water there was no outlet for centuries, nor until the land was ditched and cleared perhaps seventy or eighty years ago. This land though often cultivated in corn, wheat, and oats, never to my knowledge produced a good crop of either. The land after being plowed up is as light as a bank of ashes almost, and looks remarkably rich. It produces briars and sorrel in abundance.

A few years ago I set fire to a kiln of about two hundred bushels of oyster shells, but soon after a very heavy rain commenced, and continued to fall so that much of the lime was imperfectly burnt. I however beat up the half burnt shells, and mixed all together and spread it on land plowed for corn. The lime extended a short distance into the edge of this pond; the balance, or much the greater part of the pond or basin, had no lime, but instead of lime a mixture of Mexican and Peruvian guanoes was applied I saw little or no difference in the product of corn; yet the limed corn was a shade greener through the season, and there might have been a little difference in the size of the ears in, favour of the limed, but if there was any difference in the size of the stalks, it was in favour of the guanoed.

The following spring the whole was seeded with oats, and after harrowing them in with clover also. The corn rows ran on the adjoining higher land down through the pond. Last summer, 1858, the oats were cut, and it appeared that although the whole oat crop was light, (partly from the season,) yet the clover seemed to take well. I observed last fall that the clover on the high land, both guanoed and limed, was quite good for such land, but as soon as I reached the pond, the clover was much better on the limed side of the line than it was on the guanoed; the surface was freer from volunteer grass and weeds,—and what I wish to be particularly noted is, that *I saw scarcely a sprig of sorrel on the limed part*, and an abundance on the guanoed, distinguishable to the very line, which line had been marked by a blazed tree.

At this time, April 24th, 1859, I can see little or no difference in the growth of the clover on the high land, but as far as you can well see it, the clover in the pond is far better where the lime was spread than where the guano was used; in fact, the clover and the part not limed seems to be nearly destroyed, and weeds and sorrel have taken possession, while but little sorrel or weeds are to be seen on the limed part.

But to return to the subject of the improvement of our land. Generally, in my neighbourhood, the permanent improvement of land seems to be but little thought of. To make the most that can be made with guano, seems to be the ruling passion. Corn, wheat, and tobacco are our principal crops—with some oats. I have been a little amused often, and I must confess a little sorry too, when I hear of Mr. Such-a-one having a splendid lot or crop of wheat, the best in the whole neighbourhood, the owner showing it with the greatest complacency, as if he deserved a medal for his art in agriculture; while at the same time if you should turn your head to the right or left, you may behold the signs of Virginia farming given in, I think, one of Governor Wise's Anti-Know-Nothing speeches.

I will not say that the use of Peruvian guano, as it has been practised among us, does not and has not, to some extent, improved our lands. I think I have seen its good effects in some neighbourhoods on extremely poor land. I feel very much tempted to tell an anecdote about one of these great crops of wheat; but lest the joke might reach the ears of my friend I desist.

I come now to the point. What must we poor-land farmers do to improve our lands permanently, paying heavy taxes, and living with tolerable comfort while we are about it? I once (some thirty odd years ago) asked such a question of the venerable Editor of the Farmers' Register. I think he recommended lime. And were I to ask him again, he would probably say lime! Whether he would or not, I should like to hear from him on the subject. The want of a good *system* is the difficulty with the farmers in my neighbourhood. What shall that be? It must be an *easy* one, or only a few will follow it. It must be IMMEDIATELY remunerating; if so, many will spend money freely, as is proved by the very liberal outlays for guano. The same system may not be equally well adapted to all soils, even in the same district of country, as is seen in my experiment with lime above detailed.

The great difficulty with me in improving my land has been my stock. I have only five fields for regular rotation, and with my present system, which I know is a very bad one, I am compelled to graze a clover field the first year it comes to perfection. This is death to the clover and land both; therefore, for my wheat crop, which is a fallow of the second year of clover on the same field, I only improve the land by the application of guano. I do not, however, confine myself to Peruvian, but come as near lime as I can, by mixing two parts of Mexican, containing from 54 to 63 per cent. bone phosphate, with one part of Peruvian, at about the rate of 80 lbs. Peruvian to the acre. I have generally made very good crops of wheat with this mixture, and the quality excellent,—without some disaster, such as joint-worm, chinch-bug, or, as last year, blight, scab, or whatever else you may call it.

You see, now, that my five-field system is wheat, corn, oats, clover two years, &c., &c. I believe grazing closely very injurious to lands which are extremely poor, while we are attempting to improve them. I believe without grazing we may make lands quite productive in a few years, with Peruvian and phosphatic guanoes mixed, or good phosphotic guano alone and clover, with good plowing. I will give a sample from memory. Near the dwelling in which I live, built some ten or twelve years ago, was a piece of land, just before my eyes as I now write, excepting a spot about the middle of it, where there stood years before an old dwelling. It was as poor a piece of land as I ever saw. The hen's-nest grass grew very thinly, and hardly at all on some of it. It had been exhausted by long cultivation and grazing without manure. (This lot of land is not a part of my regular shifts, so I could manage it as I pleased.) It was plowed up and cultivated in corn. Of course there was not much corn made, except where the old houses had stood. Just at that time—perhaps the year before—a little guano had been used in the neighbourhood. I concluded after cutting a very poor crop of oats, following after the corn, to fallow it the same summer for wheat, and to use Peruvian guano upon it. Peruvian guano then sold for about fifty-three or fifty-four dollars per ton in Baltimore. I put on it about 280 lbs., which cost me about $7 50 per acre. I made by measure about twenty bushels per acre, and sold the wheat at $1 25 per bushel. I seeded clover on the wheat in the month of February. The clover, however, did not succeed. I cut only a few of the best spots, and that from necessity, the second year. I had been convinced that phosphate of lime would be more likely to improve the land than Peruvian guano; so, in the fall of the second year of the clover, I fallowed the land for wheat, and bought Mape's Superphosphate of Lime, at about $50 per ton, and put at the rate of $12 50 of that per acre, and seeded nearly two bushels of wheat per acre. I made about twenty bushels of wheat per acre; but the wheat was not so large and tall, nor were the grains so large as the first. I sold that wheat also for $1 25; and renewed the clover. After standing about two years, it had a considerable coat of clover, and running briars were very plenty; I concluded to fallow and cultivate in corn. I did so, and it was a very good crop. I made a little over four barrels per acre. I then seeded in wheat, spreading Mexican guano alone. The wheat crop was ruined almost by chinch-bug. I suppose I did not make over five bushels per acre, and the wheat indifferent. I seeded timothy, but it took badly. Last fall, 1858, fallowed for wheat. It was as much as I could do on much of the land to turn under the coat of clover and weeds with Watt's No. 12 and 13 plows, with three mules to each. A corner of the lot, about four acres, was cultivated in tobacco. The whole lot at this time is in wheat, and is just before me as I write; and though late, looks very well. No guano put on the land, except near the edges a little was spread where the land appeared poorest.

I should not omit to say here, that this lot of land is naturally of inferior quality, as the amiable James M. Garnett once said about another tract, it was "*born poor.*" Had this land been as closely grazed as my rotation shifts, I doubt whether it would have been anything like as much improved as it is.

Yours, THOS. B. ANDERSON.

For the Southern Planter.

Experience in the Use of Fertilizers.

KING WILLIAM Co., Sept. 6th, 1859.

Mr. Editor:

It is so seldom that my name or that of any other farmer from the county of King William is seen in the Planter, that I hope you and the kind readers of your invaluable periodical will pardon me for a few remarks, in which I wish to give my observation and experience as to the use and comparative effects of various kinds of fertilizers, artificial and natural.

When Peruvian Guano was first introduced in this country, its superiority over all other manures was not questioned, and the farmer bought it at a remunerating price. In consequence of the increased demand for the article, and the monopoly of sale held by the Peruvian Government, the price rose—several other guano deposits were discovered in the meantime, but upon analysis none were found so rich in ammonia as that brought from the coast of Peru—and hence did not meet with so ready a sale. At this juncture the manufacturer steps in between the grumbling farmer and the Peruvian Government—and says to him, I can sell you a compound fertilizer at a reduced price, in all respects equal, if not superior to Peruvian guano.

Messrs. A., B. & C., advertise for sale "Manipulated Guano," warranted to contain 8 per cent. of ammonia, and from 40 to 50 per cent. of phosphate of lime, and equal to any fertilizer ever offered in market.

Messrs. D., E. & F., invite the farmers to buy their "Phospho-Peruvian guano," (warranted to contain 8 per cent. of ammonia and 45 per cent. of phosphate of lime) in preference to Peruvian because less costly, more permanent in effects, &c.

Messrs. G. and H. call the attention of the farmers particularly to their regularly analyzed and warranted article called "Super-Phosphate of Lime."

Some samples of the above fertilizers are analyzed by scientific men, and found to contain the per cent. of ammonia and phosphate of lime, or other ingredients that the manufacturer warrants them to contain.

Now I appeal to you fellow-farmer to say if, under existing circumstances, you are not bewildered in your choice of a fertilizer that will, most probably, increase your crops and add fertility to your soil. If you will follow my advice you can be relieved of your bewilderment without any risk. I would say to you, *purchase a fertilizer neither of Messrs. A. D. or G.* or *of the Peruvian Government;* but *pursue the five or six-field system of cultivation,* and buy *lime (if accessible) and sow peas and clover.* By this judicious mode of farming you will not only increase the productiveness of your land, at comparatively little expense, but vastly enhance the value of it, so that your children and grand-children may reap an abundant harvest, and look back with pleasure and pride at the husbandry of their forefathers.

Suppose your soil is deficient in calcareous matter, as is the case with most soil in this section of Virginia, and lime or marl is not accessible. In this emergency I would say to the farmer (provided he has much poor land like myself) *buy sparingly* of some kind of fertilizer. What kind of fertilizer he should buy I am somewhat puzzled about giving advice; but will give my observation and experience, and let him decide for himself—and first, as to DeBurg's superphosphate of lime. In the fall of 1856 I bought of Ed. Wortham & Co., Richmond, Va., agents for DeBurg, six tons of superphosphate of lime. I applied it on a piece of fallowed land at the rate of 300 pounds per acre and harrowed it in with the wheat. On an adjacent portion of of land I applied Peruvian Guano at the rate of 150 pounds per acre. On another portion of adjacent land I applied no fertilizer. There was but little difference in the quality or texture of the soil experimented upon. The effect from the Peruvian Guano was very apparent, but the effect from the superphosphate of lime was not visible, nor have I ever perceived since that time that the land has been benefited. The same field is in corn this year, and the corn on that portion covered with superphosphate of lime in 1856 is no better than the rest. My observation, in several intances, coincides with my sad experience. As to Rhode's superphosphate and others, I can say nothing, as I have never seen any tried. The fall of 1857 I was afraid to make another experiment with a manipulated fertilizer; and consequently purchased altogether Peruvian Guano, which would have had a fine effect on the wheat crop, but for the rust and scab which seriously affected most of the wheat crops in this section.

In the fall of 1858 I bought 4 tons of Elide Guano, 2 tons of Peruvian Guano, and 2 tons of Kettlewell's Manipulated Guano. I made several experiments with these guanos. The first experiment was on six acres of land of same quality. On one-third of it I applied Elide Guano—on one-third Peruvian, and the remaining third Kettlewell's Manipulated Guano. On each portion the guano was sown broadcast and harrowed in with the wheat. During the winter and early part of the spring the Elide Guano looked better than the Peruvian—but at the time of harvesting I could see no difference. Kettlewell's Manipulated Guano never looked as well at any time as either of the two other kinds, and the difference was very perceptible about harvest time. The same quantity of each kind of guano was used in the experiment. I did not measure the wheat from each portion of land, as I was satisfied as to the result of the experiment without it.

The rest of my Kettlewell's guano was drilled with the wheat at the rate of about 175 pounds per acre. The effects on the wheat crop was very visible, but fell far short of my expectation. A piece of land of inferior quality to that drilled with manipulated guano, was sown broadcast with a mixture of one-third Peruvian and two-thirds Elide Guano, and the wheat drilled by itself. The wheat on this land was much better than on that to which Kettlewell's Manipulated guano had been applied, although the last was applied in the drill and the first sown broadcast with a less quantity per acre.

I made another experiment to see whether Peruvian by itself, or Peruvian mixed with Elide Guano was the best; but could see but little, if any difference between the two. A portion of land covered with a heavy pea fallow produced more wheat and of better quality than any of the land covered with mixed, or manipulated, or Peruvian Guano. My mixed guano was composed of one-third Peruvian and two-thirds Elide Guano, which made a ton of the mixture cost $46 66⅔, estimating the Peruvian at $60, and the Elide at $40, the price I paid for each. Kettlewell's Manipulated Guano cost $47 50 per ton, although 200 pounds per acre was not so beneficial as 150 pounds of my mixed guano. I saw one crop of wheat this year on which Kettlewell's Manipulated Guano had been applied at the rate of 200 pounds per acre, and the owner of the crop and myself both agreed in the opinion that the application did the wheat crop no good. However, I have heard of some applications of this fertilizer that proved more satisfactory.

Although I was pleased with the effects of Elide guano, still I would not advise the purchase of it, because of the wet condition it comes in, which renders it difficult to sow; and besides the ammonia escapes from it very fast if exposed for a length of time, as tested by some that I kept through the winter.

I have never tried any of Reese's Manipulated Guano, but I saw one experiment made with it in 1857, with which I was very much pleased. In that instance Peruvian and Reese's Guano were sown side by side, and I could see no difference. I have seen others who made experiments with it, and did not like it so well.

Mr. Frank Ruffin has commenced the manufacture of a manipulated guano in the city of Richmond; and the farmers wishing to buy a manipulated article, I would advise to buy it of him, as I know him well personally, and what he says can be relied on. I am certain he would not intentionally deceive the farming community. I have been through his establishment, and was pleased with the process of manipulation and the quality of ingredients used. I have purchased two tons of Ruffin's Manipulated Guano, and mean to give it a fair trial, with Peruvian, and a mixture of Peruvian and American Guano. So Mr. Editor, you may probably hear a little more of my "observation and experience as to the use of fertilizers" next fall, if you are not sick of it already.

PAMUNKEY.

For the Southern Planter.

Superphosphate of Lime.

TO ED. SOUTHERN PLANTER:

Esteemed Friend:—The following is the receipt which I promised to send thee for making superphosphate of lime.

Prepare a bed on some hard piece of land by scraping away the loose earth, on which place mould from the woods 6 inches thick. The diameter of the bed should be about 8 feet, and the edges raised in a ridge a foot high—in the basin thus formed, place 10 bushels of fine bone dust, on which pour about 10 gallons of water, or more if necessary, to wet the bones thoroughly. Then add one carboy (about 150 pounds) best sulphuric acid, and keep well stirred as long as any gas rises from it. Let it stand 3 days, then add 150 pounds of the best Peruvian Guano, and sufficient *dry* woods mould to put it in good condition to sow by hand,—it is then ready for use, and should be sown on, and raked in with the wheat, or where a drill is used, raked in before the drill, but never plowed in, as it should be kept within 2 or 3 inches of the surface.

The above quantity will be sufficient for 3 acres of land, and will, I think, in its immediate effects, be equal to an application of 200 pounds of Peruvian Guano per acre. The cost about as follows:

600 pounds of Bone-Dust at $30 per ton,	$9 00
150 " best Sulphuric Acid, 3 cts.,	4 50
150 " best Peruvian Guano, 3 cts.,	4 50
	$18 00
200 pounds best Peruvian Guano, per acre, on 3 acres 600 lbs. at $60 per ton........	$18 00

As I have said before, I am led to believe from my experiment, that on the first crop the effects of the two above mentioned applications will be about equal; but the after effects or permanency of improvement is decidedly in favor of superphosphate. When, by rotation, the field where I had made the experiment came to be grazed, I noticed that the cattle were much fonder of grazing on that portion of the field, and kept it grazed much closer. I should add too, that when it come to be cropped again, with a like application of guano over the whole field, the yield on that portion was decidedly the heaviest. In the fall of 1857, we measured up from 10 acres, (on a large portion of which the superphosphate had been applied 3 years previous) 138 barrels and 2 bushels of corn—very nearly 14 barrels per acre, the largest yield I have ever seen on high land. I intend to repeat the above experiment this fall, and would be glad if some other farmers would try it.

Respectfully thy friend,

JOHN B. CRENSHAW.

Agricultural Geology.

BY JOSIAH HOLBROOK.

No. I.—Elementary Instruction.

No class of the community has an equal interest in geology with farmers. No science is so interesting to farmers as geology in connection with chemistry. The two sciences cannot be separated and justice done to either. While the elements of our globe, especially of soils, require chemical tests to determine their character, these very elements are absolutely essential for experiments to determine the fundamental principles of chemistry. Oxygen, the most powerful chemical agent in creation, is also the most abundant material in rocks and soils. The one as an element, the other as an agent, are alike essential to each other, and both indispensable, as at the found - tion of all agricultural science.

A knowledge of each is as feasible as it is important—entirely within the comprehension of a child six years old. Each is a science of facts more than of abstract reasoning—of facts, too, equally instructive and delightful to every young mind.

Take an example: The child has placed before him two glass tumblers—the one containing quartz, the other lime, or sand and chalk. The name of each is of course as readily learned as the name of iron, lead, gold, tree, horse, or any other object in nature or art. Into each tumbler is poured some sulphuric or muriatic acid. In the tumbler of lime the pupil observes an action—in that of quartz no action. He is told this action is called effervescence. He hence learns to recognize lime and quartz, and the more certainly from the recollection that the one effervesces with acids and the other does not.

Here is an example of geology and chemistry, alike useful to the farmer and interesting to the farmer's child, or any child. The same simplicity and direct fundamental instruction run through the whole of both of these exceedingly practical sciences.

I may he eafter point out a few of the leading principles of these two sciences; their connection with each other; their essential importance to all classes, and, most of all, farmers; their exceeding fitness for the early instruction of children, and the entire feasibility of having them among the "first lessons" taught in each of the eighty thousand American schools.

No. II.—Simple Elements.

Oxus is the Greek word for *acid;* ginomai, in Greek, means *make;* hence the literal meaning of oxygen is *acid maker.* Combined with sulphur it forms sulphuric acid; with nitrogen, nitric acid; with carbon, carbonic acid, &c. Respiration, combustion, and fermentation are the three principal operations producing the combinations of oxygen and carbon; the results, carbonic acid.

Acids combine readily with metals, earths, and alkalies—as iron, lime, and potash. By chemists these combinations are called salts, designated by the termination *ate.* Sulphuric acid combining with various bases, produces sulphates; nitric, nitrates; carbonic, carbonates. Sulphate of lime is gypsum, or plaster of Paris; sulphate of iron, copperas; of soda, glauber salts; of magnesia, epsom salts. The carbonate of lime is common lime-stone, marbles, chalk, and many beautiful crystals. Carbonates of iron, copper and lead, are ores of those metals.

About a century ago water was found to be composed of oxygen and hydrogen, and common air of oxygen and nitrogen. About half a century since oxygen was found by Sir Humphrey Davy to be an element of rocks, of course of soils, as it was of the alkalies—potash and soda. The other elements in the earths and alkalies, combined with oxygen, were found by the same great chemist, to be metals very peculiar in character.

It hence appears that oxygen is an element in air, earth, and water, existing abundantly in solid, liquid and ærial forms. In the whole it constitutes nearly half our globe. It is, of course, the most abundant element in the material world. It is also the most important agent in producing changes in matter essential to human existence. It is very appropriately called *vital air*, as neither animal life nor any life can exist without it. It is no less essential to combustion than to life. It also acts with great energy upon metals and other solid substances. In this action it produces three very large and very important classes of bodies—oxides, acids, and salts. Iron rust is the oxide of iron; the dross of lead, oxide of lead; burnt lime, the oxide of calcium; pure potash, the oxide of potasium; pure soda, the oxide of sodium; silex or flint, the oxide of silicum. The combination of one part oxygen and four of nitrogen constitutes the atmosphere; three parts oxygen and one nitrogen form nitric acid—aquafortis. Combined with other substances, it forms numerous acids—saltpetre is the nitrate of potash. The large quantity of oxygen it receives from the nitric acid fits it for a material in gunpowder—giving to that powerful agent its principal power.

A plate, tumbler, and scrap of paper, with a little water, will enable any teacher or parent to perform an experiment on oxygen equally simple, instructive, and interesting. In a deep plate pour some water. On the water place a scrap of thick paper, piece of cork, or other light substance; on that another piece of paper or cotton moistened with oil. On lighting the paper or cotton, place over it a large empty tumbler. The combustion continues for a few seconds, and when it is extinguished the water occupies about one-fifth of the space in the tumbler, showing the necessity of oxygen for combustion, and that it constitutes about one-fifth the air we breathe. What man, woman or child would not like to be familiarly acquainted with an element so abundant—an agent so active as oxygen, especially when such an acquaintance is equally simple, useful and delightful?

No. III.—Elements of Rocks.

Rocks are the oxides of metals. Silex, the most abundant ingredient in rocks, mountains, and soils, is the exide of silicum. This oxides constitutes nearly one half of the solid matter of our globe. It is the principal element of quartz, in all its varietie, which are exceedingly numerous, and some of them very beautiful. Quartz is the only mineral found everywhere. Sand is pulverized quarts. Pebbles are fragments of quartz, rounded by attrition. Gunflint is quartz, breaking with a conchoidal (shell like) fracture. Jasper is red quartz, with a fine compact texture. Amethyst is purple quartz, frequently found in six-sided crystals, which is the common shape of quartz crystals in its different varieties. Agate is clouded quartz in numerous varieties, some of which are much used for watch-seals, finger-rings, breast-pins, and other ornaments. Carnelian is quartz of a fine texture and of a yellowish red colour. Chalcedony, blood-stone, catseye, and many other gems, are varieties of quartz.

Most, perhaps all, the gems used in the breast-plate of Aaron, the high-priest, were quartz of different textures, colours, and hues. The precious stones presented by the Queen of Sheba to the King of Israel were probably quartz. The stones mentioned in the Book of Revelation, as forming the streets of the New Jerusalem, with all the gems referred to, were but varieties of the stones used for paving our streets, and of the earth moved by the plow and the hoe of the farmer, and of the dirt carted for filling our docks.

The colouring matter giving most of the beautiful hues to gems, and an endless variety of colours to quartz, is the oxide of iron. The oxide of silicum and the oxide of iron are hence united in this same most abundant mineral in the world.

Next to quartz, felspar, or clay formed by the decomposition of felspar, is the most abundant element of soils. This, too, is composed of several oxides of metals in chemical combination. Felspar is also very extensively united with quartz in the formation of rocks, not by chemical combination, but mechanical mixture. The felspar and the quartz can be separated by the hammer. Not so with the oxygen and silicum, forming silex. Chemical agency alone can separate chemical combinations. Such combinations in rocks, soils, and other mineral bodies, are exceedingly numerous, complicated, and delicate. The most common stone that meets the eye in any part of the world is composed of two oxides. The oxygen and the metals each united by chemical affinity, and then the two oxides are again combined by the same agency to form a "*common stone*," evidently worthy of more respect than it *commonly* receives.

An experiment: Pour upon a little pearl-ash in a tumbler some strong vinegar. An effervescence will follow, producing carbonic acid. A burning candle immersed will be extinguished, showing that carbonic acid is fatal to combustion. It is equally so to life.

No. IV.—Elements of Soils.

Felspar is composed of four oxides—silex, alumina, or clay, iron, and potash; silex predominates. Of quartz, in all its varieties, it is almost the entire element; of felspar, it is the principal; aluminous or clay soils contain frequently twice as much silex as alumina; the quantity of iron and potash in felspar is small, not often over two or three per cent.

It appears then that sand is composed of two oxides or chemical combinations again combined by the same agency. Felspar or clay is composed of four oxides, also combined by chemical affinity, to form a compound still more complex than quartz or sand. The quartz and felspar are combined by a mechanical mixture to form rocks and soils.

It hence follows, that in these two elements of soils, quartz and felspar, or sand and clay, are not less than six combinations of ultimate principles, or oxygen and metals, all by chemical affinity, and two combinations at least of those compounds forming those two elements. These six chemical compounds, again compounded by chemical agency, are then united by mechanical mixtures to form rocks and soils.

Quartz and felspar are not only the essential elements of soils, but also among the most important materials in the arts of civilization. The principal material of glass is quartz; that of porcelain, felspar. The presence of potash, soda, or some alkaline substance acting as a flux, is indispensable in the manufacturing of each of these important articles of domestic economy.

After performing the important agency of producing vegetation—of course furnishing our wheat, our corn, our beef, and our pork—quarts of a porous character constitutes the French burr, for changing grains into flour. Pulverized quartz, cemented by iron into sandstone, forms our grindstones, for sharpening the axes and chisels of the mechanic and the knives and scissors of the house-keeper. For some animals it is essential to the process of digestion; fowls cannot live without it.

Everything, animate and inanimate; every product of nature and of art; every human being in every position and condition of life—the sturdy farmer, the busy mechanic, the industrious house-keeper, the delicate refined lady, the polished gentleman, the enlightened teacher, the wise statesman, and the noisy politician; in a word, everything which has physical existence, bears visible testimony to the necesity of this important element of mountains, rocks, and soils—of quartz, sand—"*a common stone.*"

Experiment.—Shake a tumbler, containing a little newly-slaked lime and some water; let the tumbler stand till the lime settles and the water becomes clear; pour the water into a tumbler, and blow into it air from the lungs through a quill or pipe-stem; the clear water becoming turbid with white flakes or a sediment, by the carbonic acid from the lungs uniting with the lime in the water, forming the carbonate of lime.

No. V.—Granite Formations.

Mica is a compound of oxides, more compounded than either qnartz or felspar. It contains all the oxides entering into both these minerals, with the addition of manganese, much used for bleaching salts, (chloride of lime) Mica also contains traces of the silicate of magnesia—the article used in the manufacture of epsom salts and other chemicals. The silicate, as its name denotes, contains silex, or the oxide of silicum. It has been found by the progress of geology in large quantities, both in Pennsylvania and Maryland. From it have been made various chemicals, and among them epsom salts, (sulphate of magnesia,) at so cheap a rate, in such quantities, and of so good a quality, as entirely to supersede the importation of this article, so extensively used for medical purposes. In connection with this silicate and other magnesian minerals, chrome ore (chromate of iron) has been found, and chrome yellow (chromate of lead) made from it, with such success as to reduce the price of that valuable paint from fifteen dollars to twenty-five cents a pound; thus bringing the benefits of geology and chemistry to every individual in the community

—at least to every man and woman who rides in a carriage with yellow paint, and to every child who uses an atlas with coloured maps.

Mica is not an important element in soils, and in rocks is less abundant than either quartz or felspar. Though not abundant in rocks, it is one of the three materials of granite, and has an important influence in modifying the character of rocks in fitting them both for agricultural and architectural purposes. It gives to gneiss and mica slate, both granite formations, a facility in being worked into slabs of greatly extended surface, fitting them for side-walks, bridges, floors, farm enclosures, and numerous other purposes. These two abundant rocks in granite formations can be readily formed into slabs of an extended and smooth surface, by the use of the hammer, chisel, and wedge; while most rocks, not containing mica, require the drill in addition to the other instruments named.

Good specimens of mica slate may be seen in the walks from the National Capitol leading to Pennsylvania and Maryland avenues. It is obtained from Bolton, Connecticut, twelve miles east of Hartford. Gneiss is the common material used for side-walks in Washington, as it is for the basements of all the public buildings now in progress in the national metropolis. It is obtained from the banks of the Potomac, from five to eight miles above Washington. In this exhaustless and valuable deposit, are interspersed extensively very brilliant cubical crystals of the sulphuret—not sulphate—of iron, known among miners as "*fools' gold*," and strikingly illustrates the old adage that "all is not gold that glitters."

EXPERIMENT.—Any person drawing a piece of felspar across some quartz, and then the quartz across the felspar, may ascertain which scratches the other, and of course the comparative hardness of these two essential elements of soils, the oldest friends and the strongest "unionists" upon our globe.

No. VI.—LIME FORMATIONS.

Lime formations are more *ates* than *ides*. Carbonates are most abundant, various, and useful, frequently very beautiful. Common limestone of different textures and colours, most, perhaps all, the marbles, chalk, and crystals, of various forms and hues, are the carbonates of lime; about forty-four parts carbonic acid, and fifty-six quick-lime—oxides of calcium.

Next to the carbonates of lime, sulphates are most abundant and useful. Common gypsum, a powerful manure; alabaster, much used for ornaments upon a beautiful polish, crystals of considerable variety and beauty, are the sulphates of lime.

Fluate of lime is another calcareous formation. It is known as flour spar, also Derbyshire spar. It receives a fine polish, when it is used for various ornamental purposes. From the fluate of lime fluoric acid is obtained, which has the power of acting on glass. By covering any piece of glass with a thin coat of wax, then drawing through the wax letters or any figures, and exposing the glass to fluoric acid, etching is produced on the glass. The fluoric acid is set free from the lime by charging it with sulphuric acid.

Nitrate of lime, though not common, is found in some considerable deposits. It has been supposed that it would furnish a good material for producing the oxygen gas for the calcium light. Bones are the phosphate of lime. Chloride of lime is a manufactured article, formed by exposing lime to chlorine. It was first manufactured some forty years since, and is now a most important article in the manufacture of cotton fabrics. It has great bleaching powers.

Every child knows that lime formations, especially carbonates and sulphates, are alike essential for the purposes of agriculture and architecture. They are essential to the greatest fertility of soils. By a proper mixture of quartz and felspar, or sand, clay, and lime, a soil becomes permanently fertile. The three may be considered the essential elements of soils, though sand and clay, without the presence of lime, produce vegetation. Both the sulphate and the phosphate of lime probably act more as temporary stimulants of vegetation than as essential ingredients in soils.

By taking a review of the *ides* and *ates* already presented, as forming the elements of mountains, rocks, and soils, no one can well fail of being struck with the simplicity, beauty, and practical utility of geology and chemistry, as at the very foundation of the most practical knowledge, of course peculiarly fitted for the very "first lessons" both in schools and families.

EXPERIMENT.—By applying the thumb nail and the point of a knife to the different lime formations, especially the carbonates and sulphates, it may be found which give to the former, and whether all yield to the latter. Their hardness, compared with each other, also with quartz, and other minerals, may thus be ascertained.

No. VII.—ALKALIES AND ACIDS.

Lime is an alkaline earth. As an element of soils it is far less abundant than quarts or felspar. As a chemical agent it has more power than either. Neutralizing acids is one of the most important agencies of all alkalies. Lime performs that agency both in agriculture and domestic economy. Take a case in the former. Every farmer is familiar with two kinds of sorrel growing on plowed ground. The most abundant is called sheep-sorrel, and frequently sour-dock. Botanists call it rumex ascetocella. It frequently covers plowed fields with a thick coat, containing a large amount of acid. By quick-lime this acid is neutralized and changed into a salt, probably favourable to vegetation, while the acid is unfavourable. A case in domestic economy—common ashes are the carbonate of potash, as is ley obtained from them. In making soap, the purer the potash the better, especially as it avoids the necessity of putting red hot horse-shoes into the soap to drive out witches, or even waiting till a full or new moon for making soap. By mixing lime with the ashes it removes the carbonic acid from the potash, forming the carbonate of lime; leaving the potash a purer and stronger alkali, and more powerful in assimilating the water and the oil by uniting with both, which is the chemistry of soap-making.

Lime is also used as an alkaline agent in many of the arts, and with great effect in iron furnaces and glass-making—the coarsest kind of glass. For most kinds potash or soda is used. Whether in reducing ores to metals or quartz to glass, lime acts as a flux, causing a more ready fusion. While lime, as a flux, aids the fusion of iron ore, charcoal takes from it the oxygen to aid the combustion, as most iron ores are the oxides of iron. Cast-iron still retains a portion of its oxygen, which is removed by further exposure to charcoal as a heating agent. It is thus reduced to wrought iron. By exposing wrought iron to intense heat, while bedded in powdered charcoal in a closed oven, thus entirely excluding air from it, the charcoal or carbon is absorbed in small quantities by the iron, by which wrought iron is changed into steel, which is carburet of iron, or carbon and iron. Carbonate of iron is an ore of that metal, which is said to be changed from the carbonate to the carburet, or from the ore to steel by a direct process.

EXPERIMENT.—If some pearl-ash (sub-carbonate of potash) be put into one tumbler, and some copperas (sulphate of iron) into another, and both exposed to the air, one substance will be covered with a white powder and the other attract moisture so as to become a partial liquid. The one is said to effloresce, the other to deliquesce. By trying the experiment any one can readily ascertain by which operation each is effected.

No. VIII.—ULTIMATE PRINCIPLES.

Oxygen, calcium, carbon, sulphur, phosphorus, nitrogen, hydrogen, chlorine, and flourine, are *ultimate principles* of matter—simple elements, never yet decomposed or rendered more simple. They all enter into lime formations. Oxygen and calcium are the elements of quick-lime. Oxygen and carbon form carbonic acid. The oxide of calcium, combined with carbonic acid, forms the carbonate of lime—the material of extensive mountain ranges, of lime-stone in all its varieties of texture, color, and other properties. Coral formations, extending many thousand miles in different parts of the earth, are the carbonate of lime, and used for the ordinary purposes of that mineral. Marbles, existing in several hundred varieties, are also carbonates of lime. So is chalk. So are several hundred crystalline forms of this important element of our globe. These crystals, though presented under two or three hundred different shapes, can all be reduced to one shape, shown in rhombic spar, which, if broken into fragments smaller than the head of a pin, presents in every fragment a rhombic or diamond-shaped crystal.

All the carbonates of lime are composed of three simple elements or ultimate principles, viz: Oxygen, the great supporter of combustion; carbon, the principal element of coal in all its varieties—whether mineral or vegetable, of course the most important combustible upon our globe; and calcium, a metal, also combustible. The oxygen first exists in two combinations, viz: with carbon and calcium. These two compounds are also combined, of course still more compounded, producing the most abundant carbonate, and one of the most abundant rocks and useful minerals upon our globe.

Next to the carbonates of lime, the sulphates are the most abundant and useful of lime formations. These are also composed of three elements, and the same as in the carbonates, except that sulphur takes the place of carbon. The oxygen and the sulphur form sulphuric acid; that, combining with the oxide of calcium, gives the sulphate of lime. This abundant deposit of lime formations also presents very numerous appearances. All the sulphates of lime, or nearly so, give to the thumb-nail. The carbonates yield to the point of the knife, but not to the thumb-nail. The carbonates effervesce with any strong acid, even vinegar, which effervescence shows what is called life in an eye-stone, which is the mouthpiece of certain shells; all shells being the carbonate of lime. Sulphuric acid has a stronger hold in its various combinations than most other acids, and hence is not displaced either by carbonic, muriatic, or nitric acid. Consequently the sulphate of lime does not, like the carbonate, effervesce with any common acid. The thumb-nail, the point of a knife, and any common acid, are hence sufficient tests, for ordinary purposes, to distinguish the carbonates of lime from sulphates. The sulphate, like the carbonate, appears in many beautiful crystalline forms.

Experiment.—By collecting such varieties of these two lime formations as any one can easily procure, and arranging them upon the mantelpiece, or in a case, a beautiful "Calcareous Cabinet" will be formed. These specimens, tested by each other, by the thumb-nail, the point of a knife, a piece of quartz or glass, any acid, even vinegar, also by the sight, feel, and taste, will furnish much rich instruction and delightful amusement to the possessor. If any one doubts it, let him try the experiment. If he has no doubt, he will try it of course.

No. IX.—Calcareous Crystals.

Bones are the phosphate of lime; so is a beautiful crystal called apatite. This crystal is found in granite rocks, is of a green color, hexedral shape, and resembles the beryl and emerald. The phosphate of lime constitutes a part of marl beds, and greatly increases the fertilizing power of that powerful fertilizer. It is also one ingredient of milk. In these various relations it exists in no small abundance, and performs no unimportant agency, either in animate or inanimate creation. It surely ought to be known, at least by every farmer, and of course taught to every farmer's son, and daughter too.

Derbyshire spar is the fluate of lime. It receives a beautiful polish, and is much used for urns and other mantel ornaments. It also appears in beautiful crystals, both in regular cubes and octahedrons, or equal eight sided crystals, precisely the shape of alum crystals, easily formed by dissolving alum in hot water, leaving the mass, while cooling, to arrange its particles around wire put into the form of a card-basket, or any other fancy article preferred. Nitrate of lime is another calcareous formation, less abundant and less useful than either of the other *ates* before named.

Each of the lime formations now given is composed of three elements, or ultimate principles. Two of these elements are the same in all—oxygen and calcium, or the oxide of calcium. The other elements entering severally into the compounds are carbon, sulphur, phosphorus, fluorine, and nitrogen; which, after being acidified by the agency of oxygen, combining in each case with the same oxide, form the carbonate, sulphate, phosphate, fluate, and nitrate of lime.

All these lime formations, except the nitrate, frequently appear in beautiful crystals. Some of the carbonate crystals are rhombic spar, pearl spar, dogtooth spar, tabular spar, satin spar, arragonite, and others, amounting in the whole to two or three hundred distinct crystalline forms of the carbonate of lime. Some of the crystals of the sulphate of lime are selenite, (moon stone,) fibrous gypsum, radiated gypsum, anhydrous gypsum, &c. The principal, perhaps the only crystal of the phosphate of lime, is apatite, already named, in the form of a six-sided prism, not often more than an inch or two in diameter. The phosphate of iron sometimes presents interesting crystalline forms.

Some of the most beautiful and instructive exhibitions of the wonderful science of crystallography are in the fluate of lime. The two principal crystals are those already named—the cube and octahedron—viz: six and eight-sided figures. By cleavage, these two crystals can be changed from one to the other—the cube into the octahedron, or the octahedron into the cube. Both these crystals, and their process of transformation, were beautifully exhibited by specimens formed of pasteboard with great skill and taste, as the richest possible amusement of some girls in a school in Washington, for the Scholars' Fair of New York. They were much admired and largely commented upon by the crowd of visitors.

Experiment.—Divide a piece of thin pasteboard into equilateral triangles, figures with three equal sides, say an inch and a half in length. Slightly cut the divisions by the point of a knife, for the convenience of folding them into various desired forms or boxes. Thus prepared, the paper can be readily folded into shapes to illustrate the primary crystals of the fluate of lime, alum, (sulphate of alumina,) gold, iron, lead, and very numerous other minerals.

No. X.—Calcareous Combinations.

Intense heat expels the carbonic acid from the carbonate of lime. Oxide of calcium is left. This oxide rapidly and largely absorbs water. It then becomes the hydrate of lime, as the result of slaking. The water absorbed by this process becomes solid—more so than ice. It has the same solidity of the lime itself, as it is a part of it in chemical combination. The water in changing from a liquid to a solid, gives up its latent heat, then becoming sensible heat, as is familiar to every child, from witnessing the slaking of lime while passing the street. The changing of latent to sensible heat, as manifested by the operation of slaking lime, familiar to every one, arises from a sort of fundamental principle in chemical science. This principle furnishes one of the most important items of knowledge in the whole range of science, or possible for any human being to possess—*the expansive power of heat.* It explains thousands upon thousands of interesting operations, constantly going on before our eyes, alike under divine and human agency—both in nature and the arts. It can also be as readily learnt by the child of five years as by the man of fifty.

The oxide of calcium and the hydrate of lime both possess strong alkaline powers. All alkalies have a strong tendency to combine with acids—producing neutral salts. Nitric acid (aquafortis) and caustic potash, each powerfully corrosive, combine with each other readily, rapidly, and intimately, producing saltpetre, having little or no corrosive power. Muriatic acid and soda, also corrosive in a separate state, readily enter into a chemical combination, and produce common salt, an indispensable article upon every table. It is not uncommon to have life sacrificed to an ignorance of the relative powers of acids and alkalies, not to mention stains and other injuries upon garments and other articles in daily use by every house-keeper; showing the relations of these two important agents in domestic economy.

As lime, an alkaline earth, is far more abundant than potash, soda, or ammonia, the three principal alkalies, farmers, mechanics and house-keepers can use that for its alkaline powers to far greater advantage, in many cases, than either of the pure alkalies. As the alkaline power in this abundant element of our globe destroys or neutralizes acids, both of natural and artificial production, farmers can use it for changing acids in numerous plants into salts, and probably powerful fertilizers; and house-keepers can use it for cleaning vessels, becoming acid by use in domestic economy, and in very numerous cases greatly to their own convenience. and not unlikely to the *pleasing of their husbands.*

Experiment.—Place a drop of sulphuric acid upon a piece of black broadcloth, and a red stain will be the result. Cover the stained cloth with some alkali, and the color will be restored. Dozens of similar experiments may follow.

No. XI.—Hydraulic Lime.

Hudor is the Greek word for water. Ginomai, or gennao, added, gives the origin of the word hydrogen. Metron, pathos and aulos, added to hudor, gives hydrometer, hydropathy, and hydraulic. Hydrate of lime is newly-slaked lime, containing twenty-one per cent. of water and seventy-nine per cent. of the oxide of calcium. Hydraulic lime is *water cement.* It was most fortunately discovered in large quantities at the very commencement of the Hudson and Erie canal, in the rock excavated for the work. Before this discovery, made by an agent who had visited Europe in behalf of the work, the calculation was to import this indispensable article from Europe. It has since been found in very numerous and large deposits, adding immensely to the facilities and the progress of the vast works of internal improvements already completed and now advancing by American enterprise. No one work, probably, made so large a demand for hydraulic lime and water cement as the Croton Aqueduct of New York.

The various uses, both in architecture and agriculture, for this material, are numberless and nameless. For most public works it is indispensable. For numerous domestic purposes it is exceedingly convenient. It is so powerful as a cement that two masses of stone cemented by it will sometimes break in another part of the mass before separating at the point of junction.

The oxide of iron, in connection with a portion of alumina, or clay, causes its great cementing power. In preparing it for use, it is burnt like common lime-stone. Instead of slaking, it is ground, when, with a mixture of sand, it is formed into a mortar, and ready for use.

Though numerous deposits of this very valuable material have already been discovered and brought into use, advancing immensely the improvements and the wealth of the country, deposits still more numerous doubtless yet remain unknown. Once let each of the eighty thousand schools, and the six millions of families in our country, become an "*Exploring Agency*," to discover the resources of science and of wealth under their feet and within their reach, and numberless beds of hydraulic lime, marl, valuable ores, and other minerals both rich and beautiful, will be brought to view and put to their proper use. Another discovery, still more important than lime, marl, or gold, will certainly be made in the operation. It has already been made in very numerous cases. This most important discovery, certain to be thus made, is, that bad boys are good boys—the worst the best. Leaders of rowdy gatherings will be, they have been, very often leaders in exploring expeditions: the more efficient for being juvenile, voluntary and gratuitous.

Experiment.—Let any teacher or parent request his pupils or children to find what curious and beautiful minerals they can, and the result will be, the commencement of a "*Geological Cabinet*" for the school or home of the young explorers.

No. XII.—Hornblend.

Hornblend is more tough than hard. So its name indicates. It enters largely into rocks. Hornblend rocks form some of the most beautiful and sublime mountain and landscape scenery in the world. The Giant's Causeway, in the north-east part of Ireland; the Palisade , on the banks of the Hudson river; the Bluffs, called East and West Rock, each about two miles from New Haven, Connecticut; Mount Holyoke and Mount Tom, on the Connecticut river; the richest landscape scenery on the Columbia and other rivers in Oregon; and many other views, both rich and beautiful, in different parts of the world, are hornblend rocks. The scenery about Edinburgh, Scotland, is said to resemble very nearly that about New Haven, Connecticut, exhibited by the same geological formation—basaltic columns. In both these cities, it is the common and almost only building material, admirably fitted for the Gothic style of architecture. Some poet said of the citizens of Edinburgh, who have very much impaired the natural scenery about the city for the purposes of architecture, that they had so little taste that they sold the sublime and beautiful by the cart-load. These columns are very much in the form of hexedral prisms, from six inches to a foot or two in diameter. The length of the blocks forming the prisms are frequently about equal to their diameter. Each block is concave or hollowed at one end, and convex or rounded at the other, the concave and the convex surfaces exactly fitting each other. The sides of the prisms are also as exactly fitted as the cells of a honey-comb, and of the same shape.

The most remarkable exhibition of this natural mountain mechanism is in the Giant's Causeway, where these hexedral columns, so perfectly matched, cover a great surface, and rise to the height of two or three hundred feet. The inhabitants of the country, at some ancient period, supposed it to be the work of a race of giants living there at a period still more ancient.

The property of toughness in hornblend very much modifies the character of the rocks of which it forms a part. For many purposes they are the most durable of all rocky formations. The Russ pavements, introduced into New York, are formed of a rock from Staten Island almost entirely hornblend, having a little quartz in fine grains interspersed through the mass. Though called Staten Island granite, it is very different, and entirely superior to any granite formation correctly so called. No rock upon the globe could probably be found more durable or better fitted for such pavements than this hornblend rock taken from Staten Island.

EXPERIMENT.—Draw a circle by a pair of divide s. Not changing the distance of the legs, place one point in the circumference of the circle drawn, dividing it into equal parts. It will thus form in the circumference six points equally distant from each other. Unite these points by lines drawn by the dividers, and the result will be a regular hexagon, showing the shape of basaltic columns, quartz crystals, beryl, emerald, apatite, cells of the honey-comb, and many other specimens of "NATURAL MECHANISM."

No. XIII.—HORNBLEND ROCKS.

Quincy granite is no granite; it is sienite. So are most of the Egyptian granites. This rock took its name from Syena, the name of a town in Egypt, where it abounds. Geologically, granite and sienite differ but slightly. In the relations of the two rocks to agriculture and architecture they differ essentially. Quartz and felspar are essential ingredients both of granite and sienite. Of the former, mica is the third ingredi nt; of the latter, hornblend. Granite is com osed of quartz, felspar and mica; sienite of quartz, felspar, and hornblend.

Mica and hornblend differ so essentially in their chemical combinations and mechanical structure as greatly to modify the rocks of which they form a part, both in their relations to soils and buildings, into which they enter. Both contain silica, alumina and oxide of iron; but hornblend contains twice the amount of iron of the mica, and a considerable portion of lime. Hence, when becoming a part of soils, it produces greater fertility.

Mica is exceedingly fragile in its character, readily changed into plates and fine scales to an unlimited degree of thinness; while hornblend is tough, and not easily changed by mechanical action. It hence gives much greater strength and durability to sienite, of which it is an ingredient, than is possessed by granite, of which mica forms a part. For pavements or any other use exposing the rock to friction or pressure, sienite and other hornblend rocks have a decided preference to any granite formations, of which granite, gneiss, and mica slate are the principal.

Hornblend enters into rocks of almost every proportion, from constituting nearly their whole mass to a slight sprinkling, appearing in black specks on the surface, as may be witnessed in the "Merchants' Exchange," Astor House and many other buildings in New York, and in the Bunker Hill Monument, and very many of the valuable buildings in and about Boston. The same material is more or less used for buildings in nearly all the principal Atlantic cities, from Boston to Charleston,; also in New Orleans.

Hornblend so nearly resembles black mica, as frequently witnessed in rocks, as not to be readily distinguished by the eye. The point of a knife, however, will at once determine whether the black specks are hornblend or mica, as the latter will cleave off in fine scales, but not the former—determining whether the rock is granite or sienite, and of course whether it is not fitted for a certain desired use. Hornblend rocks are perhaps more widely scattered over the country in the form of boulders than almost any other geological formation.

EXPERIMENT.—Any farmer, while passing over his fields, and especially farmers' sons and daughters, whether in their fathers' fields or on their way to school, by observing and collecting specimens of rocks meeting their eye, may readily determine whether they belong to granite or hornblend formations.

No. XIV.—STRATIFIED AND UNSTRATIFIED ROCKS.

Granite, hornblend and lime formations constitute more than nineteen-twentieths of mountain and rocky masses upon our globe. The highest peaks of mountains and the lowest depths of excavations yet witnessed are principally granite formations. Early upheavals of the earth, in its geological history, are supposed to have given to this rock—formed when it was said, "Let dry land appear"—both the highest and the lowest position in the piling of mountains.

All granite formations are composed essentially of three ingredients—quartz, felspar, and mica, combined by mechanical mixture rather than chemical combination in almost every proportion of these ingredients. Quartz is the most abundant of the three ingredients, and sometimes of itself constitutes large rocks, and even mountain ranges. Felspar, also, in some rocky masses, is the most abundant ingredient. When the rock is principally felspar, interspersed with irregular lines of quartz, giving it somewhat the character of Hebrew letters, it is called graphic granite, from the Greek word *grapho*, to write. In graphic granite the mica is entirely, or nearly, wanting, being composed almost wholly of felspar, with a slight sprinkling of quartz. Such felspar rocks frequently decompose by the action of air and water, forming porcelain clay, called by the Chinese *kaolin*.

A large deposit of felspar, of a good quality for chinaware, also for porcelain teeth, has been opened and worked to some extent in Wilmington, Delaware. That deposit, also one in Haddam, Connecticut, have furnished large quantities of felspar for porcelain establishments in this country, in addition to considerable quantities exported to other countries for the same use.

A portion of granite formations are stratified, having a slaty structure. Another portion is unstratified—the three ingredients, especially the mica, being thrown in every imaginable position. Those stratified are called gneiss and mica slate. The distinction between gneiss and mica slate is the absence of felspar, in the latter; the rock being composed of quartz and mica, of a homogeneous structure, with a smooth, but frequently undulating surface. It is more friable, and less durable for footwalks, bridges, floors, and other purposes exposing it to friction, than gneiss. It is also less readily split into slabs of a large surface, and is hence the far most limited of the two rocks in their application to purposes of architecture.

Experiments.—A teacher in Philadelphia once said to his pupils: "Boys, all who have their lessons to-day at eleven o'clock may go with me on a geological excursion." Every boy had his lesson thoroughly at the hour named—the first *thorough* lesson ever got by several of his pupils. Similar experiments continued, changed his worst scholars into his best.

In one of the New York Public Schools the teacher was greatly annoyed by seve.al truant boys, drawn to the docks of the city by the attractions upon the wharves. He at length offered to the punctual scholars exercises in drawing, also an opportunity to form cabinets of geology for the school, their homes, and sending abroad. His incorrigible truants became his most punctual scholars, and the very worst boy in school was soon known as an artist, and, as such, invited by a clergyman of the city to become the associate and the teacher of his children. Do not "working schools" and houses of refuge forcibly illustrate the adage that an ounce of prevention is better than a pound of cure?

No. XV.—Position of Rocks.

Next to granite formations, hornblend rocks occupy the highest positions upon our globe. To some extent the hornblend and granite formations are intermingled with each other. Mica and hornblend are not unfrequently found in the same mass or even range of rocks. This combination, composed of quartz, felspar, mica, and hornblend, is called sienitic granite, as it contains all the ingredients found both in granite, and sienite. Gneiss rocks also contain very often both mica and hornblend; the former giving them a slaty structure, the latter increased durability. Hornblend-gneiss is an appropriate name for such a combination. Masses of pure hornblend sometimes have a slaty structure, as found in considerable quantities in the vicinity of New York and Baltimore, in both of which cities it is used for building purposes. It may be called slaty hornblend. Fine grains of quartz are frequently interspersed through hornblend of a slaty structure, properly called hornblend slate. Crystalized hornblend is not uncommon. Such crystals are found in considerable quantity and of much beauty in Franconia, New Hampshire, in connection with iron mines, wrought there to some extent. Micacious iron ore, or mica, largely and richly impregnated with iron, is found in Franconia, furnishing interesting specimens of mineral cabinets, as well as raw materials for iron-masters.

Next to granite and hornblend rocks, lime formations constitute the highest mountain ranges. Calcareous minerals, though less abundant, are more various and beautiful than are found in either or both of the formations of granite and hornblend. Corals are immensely various and exceedingly beautiful. In the immediate vicinity of Bermuda is a field of corals, some twenty miles by ten in extent, which, seen through water several feet deep and perfectly transparent, presents an object of great beauty and richness. The prisoners at that English establishment are frequently employed to procure, by diving, specimens of coral from that exhaustless field of beauty and richness, which are sent to numerous cities and individuals upon both continents for ornaments upon mantle-pieces. In many places coral rock is used as the only building material. For forts it is probably preferable to any other material. It is more difficult to shatter by cannon balls than any other rock. Though not hard, it is tough. Coral is the carbonate of lime. The Potomac marble, used for the pillars in the assembly chambers in the American Capitol, is calcareous pudding stone. It is composed of pebbles of the carbonate of lime, of various sizes, from that of a man's head to grains smaller than a pea.

Experiments.—Some eighteen years since the Boston boys, and girls, too, prepared small elementary cabinets of geology for all the members of the Massachusetts Legislature, to be circulated among the schools in their respective legislative districts. The next Legislature ordered a geological survey of the State.

Not long after that patriotic enterprise in Boston, the Philadelphia boys, of course aided by the girls, prepared small geological cabinets, which they sent to all the counties in Pennsylvania, and, in addition, a large collection to the library rooms in the State Capitol, during the session of the Legislature. That same Legislature ordered a geological survey of Pennsylvania.

Within a year past the Washington boys and girls have prepared mineral specimens in great numbers, especially the materials of the national public buildings in that city, which they have distributed by various public functionaries, both of this and other countries, very widely over the world. The result of such a force; with a momentum so rapidly increasing, must be, at no distant period, a "Cabinet of Nature and Art" in every school in our Union, the whole making some eighty thousand "Exploring Academies" to develop and apply the mineral and other natural resources of our country; also to provide a *safety-valve* for the surplus boy power now exhibited in lawlessness and violence.

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No. XIV.—Mineral Cabinets.

Cabinets of Geology and Mineralogy, beautiful, rich, and instructive, may be collected from granite, hornblend, and lime formations. The varieties of quartz are numberless and nameless. Crystals of quartz are commonly known as diamonds. Many thousand travellers passing Little Falls of New York have heard the cry, "Do you want to buy some diamonds?" These diamonds are crystals of quartz, collected by children from the cavities of rocks in the vicinity and sold at a York shilling a handful. In Barnum's museum of New York is a quartz crystal about the size of a man's body. Single crystals of quartz, from the size of that just named, down to those not larger than the head of a pin, are uniformly hexedral prisms, pointed at each end by hexedral pyramids. Quartz crystals frequently appear in groups, furnishing richer mantel ornaments than the most costly girandoles, for which many millions have been paid within ten years past. Arkansas is rich in these articles of beauty and taste. In Missouri crystalized quartz, of great splendor, and in any quantity, is found lining the cavities of rounded masses of stone, externally as rough and uninviting as any mass of rock in the roughest stone wall in any farm enclosure. These masses, called geodes, are of all sizes, from that of an orange to a bushel basket, and even larger. Though rough without, they are beautiful within, somewhat regardless of the common way of the world in putting the best side out.

Crystalized quartz is sometimes more transparent than glass, and is thus fitted for spectacles, not liable to be scratched like the common article. Crystals of quartz are frequently of a beautiful purple hue, bearing the name of Amethyst. Smoky quartz also appears in beautiful, indeed, splendid crystals. "A Crystal Cabinet," confined to quartz alone, can easily be procured, sufficiently beautiful and splendid to secure the admiration of the most obdurately stupid.

At Ackworth, New Hampshire, beryls, larger than a man's body, the largest known in the world, have been taken from granite rocks in very great quantities—many cart loads. These, like quartz crystals, are hexedral prisms, though somewhat irregular. From this location of beryls, mica or isinglass has been procured in very large plates, and in such abundance as to supply the American market, entirely taking the place of that formerly imported from Russia. A beautiful black crystal, called schorl, is extensively deposited in granite rocks, and and frequently dispersed through masses of white quartz, in needle shape, size, and form, furnishing beautiful cabinet specimens, and even splendid mantel ornaments.

In granite formations generally, but most in mica slate, garnets are deposited in very large quantities. When this rock, of rather a frail character, largely disintegrated by rains and frost, crumbles down, garnets are sometimes so thickly spread upon the ground as to be easily shovelled up by the bushel. Garnets also sometimes appear in hornblend. They are in rounded crystals, of different number of sides—frequently dodacaedrons or twelve-sided crystals. Common and precious garnets are the two general divisions; the latter sometimes used as ornaments for rings, &c. These crystals vary in size from that of a pin's head to several inches in diameter.

Experiment.—Some boys in a New York school much in a mutinous state, were invited by a visiter to take an excursion to collect minerals to be distributed among the pupils in the several departments—girls, boys and primaries. The proposal was, of course, most gladly acceded to, resulting in specimens showing the elements of the globe, all labelled, and taken at the close of the school, on the same day, by the hands of every pupil, from the largest to the smallest, numbering more than three hundred, for the beginning of "Family Cabinets." The same school stood among the first in the city in scholarship and orderly deportment.

No. XVII.—Cabinet of Gems.

Crystal quartz are gems. So are numerous other varieties of this most abundant mineral upon our globe. The varieties of agate are very numerous, and some of them among the most beautiful of the gems. They are also very abundant in many places. Crystals of quartz, agates, jaspers, carnelians, amethysts, and other precious stones confined to the quartz family, are so abundant in different parts of the world as to make it easy for any one of the six millions of American families so disposed to procure cabinet gems, alike beautiful and useful.

Among lime formations are more than two hundred varieties of crystals. Some of them are not unfrequently combined with quartz crystals. This combination gives increased interest to each. Hence it is easy to procure from calcareous crystals varieties so numerous, rich and beautiful, as to form a cabinet of lime formations, to be placed by the side of the silicious specimens, each increasing the value of the other.

The varieties of granite are so numerous and so different as to furnish specimens of that class of building materials for a cabinet so arranged and labelled as to provide most useful lessons of instruction, and, at the same time, to be admired for their beauty. The marbles, also belonging to the calcareous formations, present several hundred varieties. These are frequently so arranged and combined in tables and other articles of household use as to form objects of great beauty and attraction. They can also be collected and arranged by the younger members of every family into a Cabinet of Marbles, greatly to their own instruction and the gratification of their friends.

From the granite, hornblend, and lime formations, a collection of building materials may with great ease be so arranged and labelled as to form an "Architectural Cabinet," combining most happily the beautiful and useful. Not less beautiful and useful may be an Agricultural Cabinet composed of minerals most useful to farmers. Such a cabinet may be prepared by every farmer boy in the land within a twelve month, if requested or even permitted by his parents. Surely, no school in the country, or the world, ought to be without the various cabinets named, especially as the specimens for them are to be found in connexion with the three principal rocky formations of our globle. They are hence brought within the reach of everybody. If they are beautiful and useful, and require little more effort to obtain them than stooping to pick them up, no good reason can probably be given why they should not be possessed and understood by each of the eighty thousand schools and the six millions of families in our Republican Union.

Experiments.—Within five years past the New York schools have made it a part of their system to prepare specimens of their improvement as "offerings to patriotism." The uniform result is, that the schools and the pupils who are most abundant in such offerings are also the first in scholarship, and especially distinguished by self-respect and orderly deportment. Hundreds of the pupils, by this honorable distinction, have also been sought for to fill places alike respectable, profitable and useful.

From the Ohio Cultivator.

How to make an Orchard.

The orchards in the older settled parts of the State, have mostly been planted forty or fifty years. They were planted as soon as the pioneer could erect a cabin for his family, and clear off a spot to plant out an orchard. The land was new and fresh, the surface soil was light, the subsoil was close and substantial; all calculated to promote the speedy growth and maturity of the trees. The clearing and fencing, the farm and other necessary employments, occupied our time until we saw our orchards would be ruined if not pruned. In doing this, many very large branches had to be taken off, and the necessary precaution was not taken to prevent the trees from suffering severely by the operation. Grafting very large trees has the same bad effect on the main stock. In short, the fruit trees in this country at the present time present a miserable prospect for raising anything like a fair crop of good, well-matured and fair fruit. Most of the old orchards are evidently fast failing, and now is the time to select the right place on the farm for a new orchard, select the *right kind of trees* from the right place, and the *right kind of fruit*, and planted in the right way, and in every respect cultivated as Nature has designed it should be, and the farmer and every other person who has the advantage of raising a fruit tree, will make the most valuable improvement he possibly can for the expense.

I will now give my views as it respects all the foregoing requirements. As it respects the *right place* on a farm, I would say, seek a northern slope and a stony or gravelly soil, stony or gravelly land is the most essential of any one consideration. The *right kind of trees* are those not large but thrifty and grafted at the root. Before a fruit tree is taken from the nursery, it should be marked so the same side will stand south after planted in an orchard that it did in the nursery. If this is thought unnecessary, look at a very thrifty shoot and you will see a difference in the colour of the sides north and south. The *right way.*—Let the tree be raised from the nursery in a careful manner. Much depends upon this, follow every root to its extremity, and carefully remove all roots without breaking or bruising. If there is a tap-root, cut it off. The place to plant a tree should be prepared some days previous to its being planted, the soil removed should be under the influence of the sun and atmosphere before it is replaced over the roots of the tree. The soil should be taken off about six or eight inches deep, five feet across. The tree when planted should stand but a trifle lower than in the nursery. If planted too deep, it will do no good until new fibre roots are produced from the tree near the surface of the ground. Much depends on the healthy condition of the fibre roots.

When the tree is set in the place designed and the sun side right, let each root be taken straight out from the tree, and if the place dug out is too small, let it be extended. When all the roots are thus extended, draw mellow soil over them, and fill up to the fibre roots, which should be combed out with the fingers and placed nicely in fine rich soil, then all gently pressed down and the tree firmly tied to a stake. Never plant a tree when the ground is wet and heavy. It is just as consistent to plant a hill of corn on wet land and then tramp on it until all is mortar, as to tramp over the fiber roots of an apple tree in the same condition. The distance of apple trees apart in an orchard, should not be less than twenty-four feet.

In cultivating apple trees in an orchard, much care should be taken to keep the soil mellow near the tree about the fibre roots, for the healthy condition of the fibre roots of an apple tree is essential to the prosperity of the tree as the healthy condition of the vitals of an animal is to their vigour and prosperity.

On our clay land nothing is better than gravel placed about the trees. It loosens the soil and protects the tree from suffering so much from the drouth. Late in the season when fruit is well grown and the tree needs all its vigour to fully mature the fruit, so it can receive the flavour nature has designed, the drouth is most likely to come, and clay ground is sure to suffer the most. An orchard needs but little manuring, generally the soil is rich enough to grow trees as fast, as is good for the trees. To take lime and mix with water, and let it remain a few days, then fill with water and let it settle clear, then wash the trees with the water, and put the sediments about the trees, is manuring enough on most land.

An overgrown tree is not sure of being a speedy bearer; the wood must be matured before it will bear. When a graft is set in a large stock of a top of a tree, it will grow very fast and thriftily, but will not bear until it receives a certain degree of maturity, while an inferior twig of the old stock will be full of fruit. Another evil of growing trees too fast, is, the fruit buds get so far advanced in the fall that they get winter-killed. When such buds are formed on wood properly matured, they never winter-kill. The apple is a fruit designed for high latitudes, and if properly managed, is a sure crop under the common course of nature. Great care should be taken in pruning the tree when first commencing to shape the top, not to suffer an improper branch to accumulate to a great size before it is removed, whereby the tree must suffer greatly and perhaps be destroyed by it. When a young orchard begins to bear, it is usually a constant bearing orchard every year, but after a few years it has its bearing year every other year. All this is for want of proper pruning. The top and root should be kept properly balanced, that is, just as much top should be suffered to remain as the roots can properly sustain. We have already considered the consequences of having too little top whereby the branches are too vigorous. When the top overbalances the root, the root can not fully sustain the top in its growth of wood, and the growth and maturing of the fruit, and preparing a proper set of vigorous fruit buds for a succeeding crop. Now the roots stand taxed by the laws of nature all this while, and in case of defalcation, there must be of necessity a derangement. An excessively large top fully loaded with fruit, taxes the roots with the nourishment to sustain and grow the tree, mature the fruit, and produce a healthy and vigorous set of fruit buds for the next year, all this the roots cannot comply with.

The main contest is between the growth of the tree and maturity of the fruit. Both participate in the affliction. The tree is stinted by the demands of the fruit, and the fruit by those of the tree. While the abundant fruit buds come in too late for bearing that year, the next spring they come forth and barely blossom, then dwindle away, giving the tree entire ascendancy for that year to grow and produce a healthy, vigorous set of fruit buds for the next year's crop, which appear the next spring so vigorous that they seem to withstand almost anything, and continue on the tree as before. To prove this theory I would call the attention of all careful observers to all full-bearing trees of this description: that a full-bearer is never a constant bearer of winter fruit, but a thin bearer, especially early fruit, is generally a constant bearer. The Golden Sweet is an early apple, the tree a thin but a constant bearer. Our common cherry trees are generally constant and full bearers. The reason of this is, the fruit leaves the tree in time for the vigour of the tree to prepare an abundance of vigorous fruit buds for the next year. Just so with the currant bush. It is a full and constant bearer, early in blossom, and stands more adversities than any other fruit; the reason is the fruit is gathered early, and the bushes are early prepared for the next year.

If this practice is correct, an orchard can be so pruned that it will constantly produce fruit in a uniform manner, and of the best kind. But if we continue to permit our trees to be surrounded by ant-hills, destroying the fibre roots of the trees and causing the constant decay of the trees and a drooping over, like consumptive people, we shall find ourselves destitute of fruit from our own neglect.

Daniel J. Durfey.

Licking Co., Ohio.

Galls and Wounds on Horses.

Galls on the Skin.—A horse newly put to work, and working in a new harness, or under a new saddle, which touches parts not inured to the pressure, is very likely to have the skin of the back and shoulders abraded.

Unless there is an absolute necessity for the animal to be used, he should, in all cases, be allowed a few days rest, that the wound may heal and become somewhat hard; even then, until the hair has fairly grown out, the greatest care must be used to see that the chafing of the harness is en-entirely obviated, as when the skin is in the least sore it is peculiarly susceptible to irritation. When a gall is fresh and bleeding, nothing will so soon dry it and cause it to cicatrise, as a little dry table salt sprinkled upon it.

After the wound is in a measure healed, if it be absolutely necessary to use the horse, a careful examination of the harness or saddle should be made, and padding should be taken out, or parts of the leather removed, to prevent any part of it from touching the wound. To prevent friction, when caused by the saddle or collar, there is nothing so useful as a piece of raw sheep-skin, worn with the *flesh* side next to the horse. In riding long journeys, it is the safest plan to have such protection always under the saddle.

If the chafing is caused by loose straps striking and rubbing against the skin, they should be covered with sheep-skin having its *wooly* side turned toward the horse.

Saddle galls are unlikely to occur, if the saddle fits the back, and is left on the horse for at least one hour (and it had better remain on two or three hours) after he is put into the stable. If convenient, he should be saddled half an hour before going out, as it is much better that the saddle should become warm, or slightly softened by the insensible perspiration of the back, before the rider's weight is put upon it.

The following is a good lotion for galls of the skin:

Sal ammoniac,	1 ounce.
Vinegar,	4 "
Spirits of wine,	2 "
Tincture of arnica,	2 drachms.
Water,	half a pint.

Mix.

If no other remedy is used, a mixture of burnt leather, gunpowder, and lard should be occasionally rubbed on the gall to prevent the growth of white hair.

Sit-fasts, and their treatment, are thus described by Stonehenge:

"Sit-fast is merely a name for an obstinate and callous galled-sore, which has repeatedly been rubbed by the saddle, and has become leathery, and disinclined to heal. If time can be allowed, there is nothing like a small quantity of blistering ointment rubbed on; or the application of a small piece of fused potassa; or even the nitrate of silver in substance, or blue-stone; all of which will produce a new action in the part, and if followed by rest from the saddle, will generally effect a cure."

FLESH WOUNDS.—The following, on the treatment of ordinary flesh wounds, is from Dadd's Modern Horse Doctor:

"Incised wounds are those inflicted by sharp instruments. On the human body they often heal without any subsequent inflamation beyond what nature sets up in the restorative process; but the difficulty with the horse is, that we cannot always keep the parts in contact, and therefore it is not so easy to unite them. * * * * If the wound is seen immediately after infliction, and there seems to be the least probability of healing by first intention, we place a twitch on the horse's nose, and examine the part. If there be found neither dirt nor foreign body of any kind, the blood had better not be washed off; for this is the best healing material in the world. The edges are then to be brought together by interrupted sutures, taking care not to include the hair between the edges of the wound, for that would effectually prevent union. Nothing more is needed but to secure the animal so that he cannot get at it. If he is to be kept in the stable, without exercise for any length of time, he had better be put on half diet.

"Contused wounds are generally occasioned by hooks, or some blunt body connected with the harness or vehicle. They generally leave a gaping wound with bruised edges. We have only to remember that nature possesses the power of repairing injuries of this kind—of filling up the parts and covering them with new skin; all we have to do is, to attend to the general health of the animal, and keep the wound in a healthy condition. Our usual application is the compound tincture of myrrh. If the part assume an unhealthy aspect, a charcoal poultice will rectify that. If such cannot be applied, owing to the situation of the wound, dress it with pyroligneous acid.—*Herbert's Hints to Housekeepers.*

Fixed Facts in Agriculture.

Somebody has made up the following list of "fixed facts" in agriculture. Though calculated for the Eastern States, many of the facts are of general application:

1. All lands on which clover or the other grasses are sown, must either have lime in them naturally, or that mineral must be artificially supplied. It matters but little whether it be supplied in the form of stone-lime, oyster-lime, or marl.

2. All permanent improvement of lands must look to lime as its basis.

3. Lands which have long been in culture, will be benefited by application of phosphate of lime, and it is unimportant whether the deficiency be supplied in the form of bone dust, guano, native phosphate of lime, composts of flesh, ashes, or that of oyster-shell lime—or marl—if the land needs it.

4. No lands can be preserved in a high state of fertility, unless clover and the grasses are cultivated in the course of rotation.

5. Mould is indispensable in every soil, and a healthy supply can alone be preserved through the cultivation of clover and the grasses, the turning-in of green crops, or by the application of composts, rich in the elements of the best mould.

6. All highly concentrated animal manures are increased in value, and their benefits produced by admixture with plaster, salt or pulverized charcoal.

7. Deep ploughing improves the productive powers of every variety of soil that is not wet.

8. Sub-soiling sound land, that is, land that is not wet, is eminently conducive to increased production.

9. All wet lands should be drained.

10. All grain crops should be harvested before the grain is thoroughly ripe.

11. Clover, as well as the grasses intended for hay, should be mowed when in full bloom.

12. Sandy lands can be most effectually improved by clay. When such lands require liming or marling, the lime or marl is most beneficially applied when made into a compost with clay. In slacking lime, salt brine is better than water.

13. The chopping or grinding of grain to be fed to stock, operates as a saving of at least twenty-five per cent.

14. Draining of wet lands and marshes adds to their value, by making them produce more, and by improving the health of the neighborhoods.

15. To manure or lime wet lands, is to throw manure, lime and labor away.

16. Shallow ploughing operates to impoverish the soil, while it decreases production.

17. By stabling and shedding stock during the winter, a saving of one-fourth of the food may be effected; that is, one-fourth less food will answer, than when the stock is exposed to the inclemencies of the weather.

18. A bushel of plaster per acre, sown broadcast over clover, will add one hundred per cent. to its produce.

19. Periodical application of ashes tends to keep up the integrants of the soil by supplying most, if not all, of the organic substance.

20. Thorough preparation of land is absolutely necessary to the successful and luxuriant growth of the crops.

21. Abundant crops cannot be grown for a succession of years, unless care is taken to provide an equivalent for the substance carried off the land in the land products grown thereon.

22. To preserve meadows in their productiveness, it is necessary to harrow them every second autumn, apply top-dressing, and roll them.

23. All stiff clays are benefitted by fall and winter ploughings, but should never be ploughed when wet. If at such ploughings the furrow be materially deepened, lime, marl or ashes should be applied.

24. Young stock should be moderately fed with grain and watered, and receive generous supplies of long provender, it being essential to keep them in a fair condition, in order that the formation of muscle, bones, &c., may be encouraged and continuously carried on.

25. Milch cows, in winter, should be kept in dry, moderately warm, but well ventilated quarters, fed and watered three times a day, salted two or three times a week, have clean beds, be curried daily, and, in addition to their long provender, should receive succulent food morning and night.

26. Full complement of tools and implements of husbandry are intimately connected with the success of the husbandman.

27. Capital is not only necessary to agricultural success, but can be properly used in farming as in any other occupation.

28. Punctuality in engagements is necessary to an agriculturist, as it is to a merchant.

29. Every husbandman should carefully read and digest matters connected with his business; his success being dependent upon a full knowledge of its principles and details, as is that of the lawyer, or physician, upon a knowledge of the science of law or physic.

30. Wheat, rye, oats and barley should never follow each other in course of rotation. There should always be an intervening hoe-crop between them.

"Marion Visitor."

List of Wonders.

Among the thousands of marvelous inventions which American genius has produced within the last few years, are the following, compiled in an abstract from the Patent Office Report:

The report explains the principle of the celebrated Hobb's lock. Its "unpickability" depends upon a secondary or false set of tumblers, which prevent instruments used in picking from touching the real ones. Moreover, the lock is powder-proof, and may be loaded through the key-hole and fired off till the burglar is tired of his fruitless work, or fears that the explosions will bring to view his experiments more witnesses than he desires.

A harpoon is described which makes the whale kill himself. The more he pulls the line, the deeper goes the harpoon.

An ice-making machine has been patented, which is worked by a steam-engine. In an experimental trial, it froze several bottles of sherry, and produced blocks of ice the size of a cubic foot, when the thermometer was up to eighty degrees. It is calculated that for every ton of coal put into the furnace, it will make a ton of ice.

From Dr. Dare's examiner's report we gather some idea of the value of patents. A man who had made a slight improvement in straw-cutters, took a machine through the Western States, and after a tour of eight months, returned with forty thousand dollars. Another man had a machine to thresh and clean grain, which in fifteen months he sold for sixty thousand dollars. These are ordinary cases—while such inventions as the telegraph, the planing machine and India-rubber patents are worth millions each.

Examiner Lane's report describes new electrical inventions. Among these is an electrical whaling apparatus, by which the whale is literally "shocked to death." Another is an electro-magnetic alarm, which rings bells and displays signals in case of fire and burglars. Another is an electric clock, which wakes you up, tells you what time it is, and lights a lamp for you at any hour you please.

There is a "sound gatherer," a sort of huge ear-trumpet, to be placed in front of a locomotive, bringing to the engineer's ears all the noise ahead, perfectly distinct, notwithstanding the noise of the train.

There is an invention that picks up pins from a confused heap, turns them around with their heads up, and sticks them in papers in regular rows.

Another goes through the whole process of cigar-making, taking in leaves and turning out finished cigars.

One machine cuts cheese, another scours knives, another rocks the cradle, and seven or eight take in washing and ironing

There is a parlor chair patented that cannot be tipped back on two legs, and a railway chair that cannot be tipped back in any position without any legs at all.

Another patent is for a machine that counts passengers in an omnibus and takes their fare. When a very fat gentleman gets in, it counts two, and charges double.

There are a variety of guns patented that load themselves; a fishing-line that adjusts its own bait, and a rat-trap that throws away the rat, and then baits itself and stands in the corner for another.

There is a machine, also, by which a man prints, instead of writes, his thoughts. It is played like a piano-forte. And speaking of pianos, it is estimated that nine thousand are made every year in the United States, giving constant employment to 1,900 persons, and costing over $2,000,000.

From the Stock Journal.

Salt and Water for Stock.

It is a mistake, by no means uncommon, to suppose that there is very little for the breeder to do during the summer months in the way of providing for the wants of his stock. It is true that the same unceasing care and watchfulness which is so imperatively demanded of the farmer during the long and severe winters of the North, is not now indispensable; but the prudent and thoughtful breeder will not forget that even at this season, when the grass is green on every hill-side, and the sleek coats and rapid growth of his animals attest the richness and abundance of the pastures, there are important matters which require his attention. Chief among these we would mention the provision of a constant and abundant supply of salt and clear fresh water. The importance of providing salt for stock is almost universally understood, and there are comparatively few farmers who entirely neglect it, but it is a common mistake to feed it at irregular or too great intervals, and without any regard to economy.

The best rule for salting animals is to keep it constantly before them, and they will then take it in such quantities, and only in such quantities, as their systems require; but if deprived of it for some time, they become so eager for it that they may eat so much as to injure them the first time they are liberally fed.

Salt boxes or troughs should be provided in every pasture, firmly secured and covered with a small roof, raised sufficiently to allow room for the animals to put their heads into the box under the cover. The small roof or cover is necessary to prevent the rain from dissolving the salt. These boxes or troughs should be kept constantly supplied with salt, and your stock will take just such a quantity as they require, and none will be wasted. It is well to locate them in such part of your pasture as you wish the stock to frequent; upon some dry knoll, if convenient, as more manure will be dropped in the vicinity of the salt troughs than upon other parts of the pasture.

Every effort should be made to supply each pasture with fresh running water.—When this cannot be done and the water must be drawn from wells, it should, if possible, be drawn daily, and not at long intervals and allowed to remain exposed to a burning sun until it becomes almost putrid. During the hot weather, water troughs should be cleaned often and kept entirely free from the vegetable fungus which will accumulate.

In many sections of the country fresh running water cannot be obtained, and the farmer is forced to rely upon artificial ponds to supply his stock. When this is the case, care should be taken to remove the rank vegetation and bushes from the banks, and thus expose the water as much as possible to the action of the winds, as it is thus kept in motion and in a great measure prevented from becoming stagnant.

Cotton.

From the Report on the "CONSUMPTION OF COTTON IN EUROPE.

BY JOHN CLAIBORNE, ESQ., *Agent of the Patent Office.*

"It may be said that it would be difficult to over-estimate the importance of cotton in the movement of the industry and commerce of the civilized world. Since the inventions of Arkwright and Watt, in England, and Whitney, in our own country, its manipulation and fabrication have become so comparatively easy and cheap, and its adaptation to supply the wants or the luxuries of man have proved to be so multifarious, that the question of an adequate supply of it to the growing demand has become one of the very highest importance, being exceeded in interest by that of the cereals alone. Its influence in the well-being of the masses by furnishing employment, sustenance, and cheap clothing has long since been fully admitted; and such has been the impetus afforded by it to the invention and improvement of manufacturing machinery, that M. Audiganne, [a French author,] remarks that, "It was certainly a curious sight, that, of the different aliments afforded by cotton to labor, and the services rendered to man at this day by this substance, of which the consumption has increased tenfold four or five times in less than sixty years. Cotton is manufactured among the greater part of the nations that figured at our side in the Palace of Industry. Nearly all had sent there samples of their fabrication—samples more or less numerous, more or less remarkable, but always worthy of attentive examination. *The degree of advancement of each people in the career of industry might be measured by its skill in the treatment of cotton.*

Illustrating its commercial and political influence as between the United States and Great Britain, Dr. Engel says of it: "That England and the United States are bound together by a single thread of cotton, which, weak and fragile as it may appear, is nevertheless, stronger than an iron cable."

No wonder, then, that the question of the adequate supply of this mighty and all-powerful agent soars at this day so far above many which, at the beginning of the present century, far outranked it in their bearings upon the interests of civilized man; and it may not, in this connexion, be deemed out of place, to allude, briefly, to the history of of the supply in Great Britain, which has long been the principal receiver of the raw material, not only to meet her own growing demands, but to be distributed, to some extent, among those European countries which commercial supremacy has made tributary to her.

* * * From the statement of Mr. Sharp, of London, given below, it will be seen how vast has been our own contribution of the raw material to Great Britain and Europe generally, and how much more reliable as a source of supply our cotton fields are than those of any or all other countries, as their production between 1851 and 1855 was five times that of the East Indies, and that, while during that period, all other countries exported to Great Britain 937,024,275 pounds, our own sent her 3,424,502,024 pounds, or more than three and a-half times as much.

In his first table, Mr. Sharp sets down the import from the United States into the United Kingdom, in 1856, at 780,040,016 pounds, that from the East Indies at 180,-496,624 pounds, and the total from all other countries than the United States at 243,846,512 pounds, leaving a balance in our favor of 536,193,504 pounds, and also showing that in that year also we contributed more than three times as much to European supply as all other countries combined, while it must be remembered that our domestic consumption was advancing so rapidly as to require for its use 652,739 bales, which, estimated at 450 pounds each, were equal to 293, 732,550, or more than the import into England that year from all other countries than our own.

Mr. Samuel S. Littlefield, editor of the New Orleans Price Current, than whom there is no better informed or more reliable authority on the subject of cotton and the cotton trade in the Union, estimates the value of our crop of 1857, 2,931,519, bales, after making all allowances for differences in their weights in different sections of the country, at an average of $50 per bale, making the total sum of $146,975,950.

From what has been said under the various heads of this report the following conclusions as to the influence of raw cotton among the nations who are our chief customers for it may be drawn:

1st. That it contributes vastly to their social well-being by furnishing labor, sustenance, and cheap and comfortable clothing to many thousands of their subjects or citizens.

2d. That to commerce it contributes immensely by furnishing a great variety of articles, by which its exchanges are in a considerable degree regulated, and large profits continually realized. That to capital, it offers the means of profitable investment and returns, and aids greatly in its accumulation.

3d. That its political influence arises from the fact, that, by opening and extending commercial relations between different nations, it has created sympathies and ties of common interest, which make the policy of peace and its attendant blessings far more easy to maintain than was once the case; that it adds to the national wealth and resources and by furnishing employment and support to many thousands who might, otherwise be without either, it makes contented those who would, through idleness or suffering, become burdens to the State.

4th. That the permanent and adequate supply of raw cotton thus becomes to Great Britain and Continental Europe a subject of vital importance, and indeed of absolute necessity; and that any considerable diminution in the crop of the United States would cause the gravest inconveniences, while the occurrence of any state of things whereby it should be entirely cut off would be followed by social, commercial, and political revulsions, the effects of which can scarcely be imagined."

Use of Charcoal.

In many parts of the country where charcoal is or has been largely made, particularly in the vicinity of iron furnaces, the old braze of charcoal hearths can be obtained in great quantities. Near railroad depots, where the contents of the spark-catchers are thrown out at the end of every trip, and at distilleries, accompanied by rectifying houses, where pulverized charcoal is used in the rectifying of whisky, large quantities may be had at low cost. By underlaying the bed in stables with charcoal, the urine is readily absorbed and rendered inodorous; the excretory gases given off from the bodies of animals are taken up, and the atmosphere rendered sweet. Where the ventilation is not perfect, the animals suffer severely from being surrounded by the excretory gases given off from the surface of bodies. Some idea may be had of the advantages to be derived from the absorption of these gases, from the fact that, if the horse be enclosed in a silk bag, varnished and tied around his neck, and leaving his head free to breathe the atmosphere, he will die in twenty-four hours, simply because the bag will contain the gases given off from the surface of the body, keeping them in contact with the animal, which should be got rid of as fast as liberated. All this will be absorbed by charcoal, and in the cleansing of the stable this charcoal may pass to the compost heap, where it will continue its office of absorbing ammonia, and even after it reaches the field it is an ever-attendant chemist, taking care of all the results of decay until growing plants use them. Soils of all kinds are improved by the presence of charcoal, and as itself is not absorbed by plants, it forever remains to re-perform its office.

Clay soils are rendered more free by its admixture. It assists soils by retaining what would be lost in the atmosphere by evaporation without it; it prevents early freezing of soils, and its dark color assists in receiving heat from the sun's rays; indeed the chief difference in texture between the old garden soil and that of the field, simply arises from the charcoal (carbon) consequent upon the decay of vegetable matter in the old garden soil. It is for this reason that garden soils are so much darker colored than those of the field alongside, and it is for this reason also, that manures applied to soils of dark color are so much longer retained, and are so much more efficient than when applied to soils in which the carbon is deficient. In mountainous districts it is quite common to drive cattle to the coalings, as the old charcoal hearths are called, for the earliest spring pasture; for around the edges of the old charcoal hearths the grass grows much more luxuriantly than elsewhere, and notwithstanding this hint the farmers in such districts continue to neglect carting the charcoal braze to their farms. If charcoal braze be thrown on top of a fuming dung heap, it will absorb all the gases arising from the fermentation of the mass, and retain them until the roots of the plants abstract them. Pig-pens should never be without charcoal dust where it can be procured; in privies it deodorizes the contents and thus forms a valuable poudrette.—*The Working Farmer.*

From the Country Gentleman.

Cheap and Valuable Paint.

MESSRS. LUTHER TUCKER & SON—Yours, requesting me to send receipt for paint, was duly received. At the time it was not in my power to furnish it, for the reason that the book containing it was not in my possession. After many inquiries yesterday I found it in the hands of a neighbor who borrowed it same years since. I did not originate the composition, but found it in the second volume of Chaptal's Chemitry, (pages 68 and 69,) an old work published in 1807.

It is intended as a substitute for white lead paint, and is composed of

Skimmed milk, 2 quarts.
Fresh slacked lime, 6½ ounces.
Linseed oil, 4 ounces, and
Common whiting 3 pounds.

Directions for mixing are—"Put the lime into a stoneware vessel, pour upon it sufficient of the milk to make it like thin cream, add the oil a little at a time, stirring to mix thoroughly; add the remainder of the milk; then the whiting (made fine) is to be spread upon the surface, and the whole well stirred. It is then fit for use. It should be frequently stirred while using."

It is applied with a common paint or white-wash brush, and will dry in three or four hours. Two coats make a perfect paint. It possesses great solidity, will bear rubbing with a woolen cloth, and does not become dingy or yellow with smoke, &c., as much as lead paint.

I have used the composition only for inside of buildings on brick and wood. Twelve years since I painted the over-head flooring and timbers, underside of a store. It is now perfect; holds its color better than white lead; is much more economical, as the chief expense is the labor of putting on.

It is also recommended for out-door work by adding to the foregoing—2 ounces lime, 6 ounces oil, and 2 ounces white Burgundy pitch, the pitch to be melted in the oil by gentle heat, and added to the mixture.

Vergennes, Vt WM. H. WHITE.

From the American Agriculturist.

Winter Management of Sheep.

BY A MICHIGAN FARMER.

The sheep is perhaps more sensibly affected by ill treatment than any other of our domestic animals; and it may be as truly said that none repay the owner as well for good keeping, and constant care and attention during winter. The losses usually sustained by the country at large, in consequence of negligence in the care of sheep during the feeding season, is immense.—During the winter of 1852–'3, a friend of mine lost seventy fine sheep. He trusted a careless man to take care of his flocks, being absent himself most of the time, and this man neglected to shelter, neglected to feed properly, to water, to salt, etc., etc., and the result was seventy rotten pelts in spring. Another farmer within my acquaintance lost, during the last winter and spring, upwards of forty, just from sheer negligence. And it is so the country over—immense numbers die every winter for want of care.

SHELTER.—Two purposes are served by shelters—they save food, and they preserve the wool from the highly injurious effects of storms and changes of weather. Where sheep are kept without shelter, the wool is wanting in those fine felting properties, which sheltered wool always possesses in so superior a degree. An old woolen manufacturer once told me he could tell, without fail, whether sheep had been sheltered or not, as soon as he began to work the wool.

Shelter is equivalent to food, in some degree. Food is required to keep up the animal heat—it is the fuel; the stomach is the fire-place, where it is consumed; and the body is the house to be warmed. The warmer a dwelling-house is, the less fuel is required. Even a belt of trees about the exposed portions saves a large amount of fuel. So with sheep, or other animals, the warmer they are kept, the less food is required to preserve the natural warmth of the body. Shelter, therefore, serves as an equivalent for food to a certain extent.

Furthermore: Good shelters reduce the losses to mere nothing. The most successful cases of the winter management of sheep are where the flocks are comfortably housed during the entire winter; and not allowed in the fields at all. I know of cases where this practice has been conducted for six or seven years, and the losses have not amounted to more than one-quarter of one per cent. The stables were well ventilated, and littered daily.

FOOD.—Sheep need a great variety of food. No animal partakes of so many different plants; hence they are fond of change, even from better to worse, sometimes, rather than to feed on one kind continually. A constant adherence to dry food, the winter through, is sure to engender the ailment known as *stretches*, which, if not attended to, often proves fatal to sheep. A feed of roots, apples, or any succulent vegetables, three times a week, will obviate all danger in this direction. To produce the finest and evenest fleeces, or an even-sized and even-lengthed fibre, nothing is more important than good food, and an even condition of flesh throughout the year. Fat at one time, and poor at another, will surely produce an uneven fibre, and materially injure the qualities of the wool for most manufacturing purposes. High feeding is certainly not favorable for the growth of the finest wool. Ruta-baga turnips in large quantities, fed to sheep during the winter, injure the quality of wool for fine fabrics, and so does Indian corn, when given plentifully. These articles of food, sparingly, do little harm—other grains, roots and beans are preferable.

WATER.—Many farmers hold to the notion that sheep need no water during winter; but surely there is no ground for it, for no animal drinks more freely, or with a better relish; and it is as essential to their health and condition, that they have a full supply regularly, as that they have a full supply of good food regularly.

Every good and experienced flock-master knows how important it is to keep sheep up in good condition in the fall, and to have them come to the sheds at this season in full flesh and health. No animal is so hard to bring up again, after becoming poor, as the sheep. Indeed, having had the experience myself, I speak feelingly on the subject. There is nothing more unsatisfying than the very humane occupation of nursing up a poor, weak, diseased animal, which has been reduced, and brought upon the sick-list by one's own carelessness and neglect.

The thoughts of the diligent tend only to plenteousness; but of every one that is hasty, only to want.

A Supply of Air Necessary to the Roots of Plants.

The main object of the practical farmer is to raise from the dead earth the living plant; and in order to do this, it has been found necessary in all countries, and in all ages of the art, to break up, and more or less to pulverize the surface soil. As this is the natural station for all our cultivated crops, and where they obtain a large portion of the necessary elemental food requisite for their development and maturation, certain conditions of the said surface become absolutely necessary. Moisture, warmth and air, in due proportions, are indispensable, both to the roots which are extended through the soil in search of mineral food, and to the stem and leaves which appear above the surface, one of whose chief functions being the absorption of gaseous matter from the surrounding atmosphere. An excess of moisture is commonly more injurious to plants than the extremes of heat and air; for when a soil becomes saturated with water for any considerable time, air is in great measure excluded from its pores, and the slow and constant evaporation which is going on at the surface, keeps down the temperature to a degree inimical to the healthy progress of vegetation. For a soil, therefore, to be made porous so as to freely admit air, warmth and moisture, with the capability of any superfluous amount of the latter freely percolating away, constitutes an axiom on which all our operations of ploughing, trenching, digging, draining, &c., are founded.

Soils, it is well known, vary much in their chemical composition and mechanical texture. The success of many crops depends as much upon the latter as upon the former; and in no case can the natural or artificial consistency of the soil be safely disregarded. Most of the winter wheat in Canada is raised on summer fallows; but the operation of fallowing is often so imperfectly done that a diminished crop of inferior quality is the inevitable result. Wheat, it is true, naturally covets a close soil; yet the deeper and more thoroughly it is pulverized, so as to allow air, warmth and moisture freely to come in contact with the roots of the young plant, the more freely will it grow, and the more abundant will be the produce. If, however, water should in any considerable quantity stagnate, so as partially to exclude air, and by surface evaporation produce cold, *underground draining is essential to the procuring of a profitable crop.*

That the contact of air to the roots of plants was always considered necessary, is evident from the oldest agricultural writers; but the principle was never so fully understood and acted upon as it has been of late years. The first and most striking instance confirmatory of the opinion was the fact of large, full grown, ornamental forest trees having been killed by their roots being too deeply covered up with earth when leveling lawns; and planters and gardeners have long been aware of the injurious effects of planting as well as sowing too deep. Formerly, it was thought that the earthy materials in which valuable exotic plants were to be placed could not be too finely sifted and mixed; whereas experience at length showed that the small particles of such soils soon run together and become a compact mass after heavy rains, thus operating against the extension of the young roots, and in great measure excluding the external air and moisture. Among coarser and looser materials, however, a considerable body of air was found to repose, and the more active fibres to extend much more luxuriantly than in closer and denser soils.

The gardener's improved practice is only another proof how much a porous soil and presence of air are necessary to the roots of plants; and yet we often see the most luxuriant vegetation produced by soils which are apparently very close in texture; such as alluvial soils and fertile clays. Both these descriptions of soils being composed of the finest atoms, become exceedingly close and compact if undisturbed; but when ploughed or otherwise periodically moved, the stirred portion attracts as much of the qualities of the air as suffices for the following crop. It is rather remarkable that while oak thrives best on a clayey sub-soil, it does not seem to affect rich alluvial land, owing probably to its closeness of texture, preventing all access of air to the place of the roots.

Aquatic plants, which live entirely submerged, although defended from external air, receive as much as they need from the surrounding water, which always contains a notable measure, besides nutritive bodies in solution, which form the pabulum of plants, whether aquatic or terrestrial.

Another tribe of plants are attached to the earth, so slightly that their system of roots is nothing compared with the bulky heads sustained; and as these plants are mostly found on rocks, or on the dryest tracts of country, it is evident that the greatest portion of their nutriment is drawn from the atmosphere. Another tribe of curious and beautiful flowering plants is called Epiphytes, because they attach themselves to the stems and branches of trees, not to sustain themselves by extracting their juices, but to be supported in the deep shade and moist air of thick tropical woods. Some of these are called *air plants*, and grow as well in a basket without earth, suspended in a warm, damp, shady place, as if they were in their native habitat.

Thus it is apparent that atmospheric air is essentially necessary to plants, and as much so to the roots as to the stem and foliage; and it is this fact, as already observed, that justifies all the means of cultivation which the farmer and gardener have recourse to with a view of rendering the staple of the soil more loose and consequently more permeable to atmospheric influences.

There is one circumstance, however, which deserves to be noticed along with these general remarks; it is this, that all seeds require to be embedded in the soil, that is, they should be in close contact with the mould on all sides; and, that this should be completely secured, some seeds, in particular soils, require a mechanical pressure of the earth upon them, as wheat for instance. Now, we have only to consider that as the soil has been previously prepared, and more or less reduced to the finest practicable state, a considerable volume of air is incorporated therewith, and that this air, according to its temperature and the moisture of the soil, facilitates the germination of the seed, and continues to assist the development of the plant. To obtain this close embedding of the seed on light, porous soils, it is the practice to press it in—a practice which is found of service to wheat, peas, beans, and almost all small seeds; but which would be of no avail without the previous disruption and æration of the soil.

All these matters premised, it only remains to conclude with a general declaration that, in all our practices and means employed for the amelioration of the land, everything that can be added or taken away, every operation performed, and every implement used in the culture, should all have for their ultimate object, either directly or indirectly, the breaking up of the compact and impervious surface, so that copious and constant supplies of air may be freely admitted to the roots of plants.

Canadian Agriculturist.

Subdivide the Cattle Yards.

In regard to the necessity for such division of cattle yards as will give equal opportunities to the animals confined therein, for progress and improvement, the *Prairie Farmer* says: "Large and small animals are turned in promiscuously together, and every farmer knows that the larger ones are very ferocious and domineering towards those much inferior, but careful not to provoke the wrath of such as are nearly equal. Turn those together that are of a similar size, and they will be more quiet. Calves generally are too much neglected, and come out small and puny in the spring. A good manager has a spacious stable for calves in one of his sheds, moderately lighted, and well sheltered from all currents of wind. This apartment is kept clean, the calves fed on good hay, and supplied with good water. They present very different appearances from other calves in the spring."

To Cook Sweet Corn.

Trim off the husks, and immerse in boiling water, with a little salt. Boil gently half an hour: then take out the cobs, rub over some butter, pepper and salt, and brown before a quick fire. Another plan—and one which most persons prefer—is to boil as above; afterwards cut off the corn neatly; return to a pan containing a sufficient quantity of milk to cover; throw in a tablespoonful of butter, the same of sugar and salt, to flavor; simmer slowly for fifteen minutes, and serve up hot.

Removing and Preventing Rust.

Some persons employ an acid to remove rust from knives. This should never be done under any circumstances. Nothing surpasses rotten-stone for scouring knives and forks. To prevent stoves and grates from rusting during summer, if situated in damp places, give them a thin coat of lard and rosin melted together, in the proportion of three parts of the former to one of the latter.

From the Farmer and Gardner.

Bone Manure.

MR. EDITOR: The important position occupied by the United States, in an agricultural point of view, demands at the hands of our farmers, closer attention to any and everything calculated to advance their profession, than, as a general thing, they have hitherto been willing to bestow. As a class, our farmers are careful enough in some directions; but very neglectful of their best interests in others. This characteristic was brought forcibly to my mind, some time since, while standing on a shipping wharf in one of our large cities. A vessel was loading with bones, and upon inquiry of the captain, I ascertained that they were to be shipped to England. The question which naturally presented itself to my mind was, "Have we no use for these bones here, that they are being shipped to England? or are they so much more valuable to the English than to the American farmer, that the former can afford to pay, in addition to our regular prices, the cost of shipment, three thousand miles across the Atlantic?" Leaving your readers to determine this point at their leisure, I propose offering a plain remark or two, in relation to the value of bones as a manure.

The English and Scotch farmers have for many years regarded bones as one of the first, if not the very first manure in point of importance. They use them in a great variety of forms, and in the growing of some of the crops, (turnips especially,) considered them indispensable. Some idea of the extent to which they are used, may be gleaned from the following facts: Almost every seaport of any consequence on the eastern coast of Great Britain, has one or more mills for the crushing of bones into a condition to be used for manure. The town of Hull stands foremost in the list, having it is said, not fewer than from thirty to forty vessels, in the docks at one time freighted with bones. In 1835, the quantity imported into Hull alone, was twenty-five thousand seven hundred tons. In 1837, the value of the bones imported into England, was £254,000, equal to a million and a quarter of dollars. Since that time the importations have been doubled. I have no means at hand of knowing what quantity of bones has been imported into the United States, but I dare affirm, that it is not one-tenth the quantity named above. Why? Why should we not import bones? or, at least, why should we not prevent their exportation?

So far as permanency is concerned, my own impressions are, that bones stand without a rival. They are, to be sure, not adapted to every kind of soil, but still may be regarded as susceptible of general use. Some farmers allow six years as the period during which bones will act favourably on pasture lands; on grass lands, successively mown, four years; and the same length of time on arable land. Others again, give them still longer periods, but all agree that as a permanent fertilizer, they commend themselves to the earnest attention of every farmer whose supply of farm-yard manure is not equal to the requirements of his land.

I am not able to speak learnedly from my own chemical knowledge of the mode in which bone manure operates upon the soil and plants; but, from a most excellent treatise on the subject, I learn the following:—The principal element in the manurial action of bones, is the phosphate of lime. This salt is scarce in soils, sparingly dispersed, and speedily exhausted; and yet it is indispensable to the vigorous growth of nearly all cultivated plants, and forms the principal stimulant to the vitality and power of several. Dr. Thompson asserts it to be a constant ingredient in plants, and a very conspicuous ingredient in the inorganic or ashy part of not a few of the most valuable. According to the most eminent chemists, 39.3 per cent. of phosphate of lime is found in the ashes of the grain oats, 44.05 in barley, 6.2 in the ashes of the straw of wheat, &c. These larger proportions show how indispensable the phosphate of lime is to the health and growth of nearly all our most useful plants, and constantly, how pervading an influence is exerted upon them by bone manure. It is asserted that turnips, potatoes, and white clover, are so powerfully affected by the presence of phosphate of lime in the soil, as to be mainly dependent upon it for their luxuriance and vigour.

Another of the values of bone manure, especially when applied in a crushed condition, is their extraordinary capacity for absorbing and retaining moisture. "It is frequently observed that when any vigorous plant upon a boned field is pulled up, it will bring up small pieces of bones with its roots; and when minutely examined, it will be seen to have grasped the little pieces and pervading their cavities with its radical fibres, while these cavities will be seen to be clammy, or even copious with the liquid nourishment on which the spongioles were feeding. The very contact which the radical fibres of young turnips obtain with bone manure, and which they cannot, with any of the ordinary methods of application of farm-yard dung, has been assigned by some farmers, as the reason of the paramount power of bones over the turnip crop."

But I have already extended this article beyond my intended limits. I am aware that farmers, as a general thing, do not like lengthy dissertations. Breaking off abruptly, therefore, I may, if this article is acceptible, present a few more arguments in favour of the use of bone manure in our country.

Yours,

8th mo., 2d, 1859. A. T. B.

A Valuable Discovery.

An ingenious discovery, consisting in the compression of fodder for horses and cattle, to reduce its bulk, and facilitate its transportation, has been made by a Veterinary surgeon, Mr. Maudin of the French Imperial Guard, and adopted by the Minister of War for the late campaign. Thus subjected to a practical trial, it has fully answered the expectations entertained by the inventor, and earned the highest testimonials from the officers of the cavalry. The fodder required for a journey or campaign is compressed into small tablets, in a manner similar to that previously in use in Europe, of compressing vegetable substances. The new process which has just been published, is described as follows:

"The hay and straw are chopped fine, the oats or corn crushed, and then mixed in proportion to the nutritive qualities afforded by each. Upon this mixture is poured a mucilagineous residue of linseed, and the whole is pressed into a hard cake, only requiring to be dried in an oven. Not alone are these cakes more easily transported than the materials of which they are composed in their crude state, being reduced to a much smaller volume but they are more easily preserved also, being less subject to atmospheric influences, dampness, &c."

Although suggested by the emergencies of war, and promising to render most excellent services to the commisariat department of all nations, this new method of preparing provender for horses and cattle is of especial value to this country, affording as it does, such great advantages to emigration parties into the far west, exploring expeditions, and encampments in distant regions.—*Pennsylvanian.*

From the Wisconsin Farmer.

To Cure Cows of Garget.

Messrs. Editors:

I hear many complaining this spring that their cows are nearly spoiled by garget, (a peculiar thickness of the milk.) Having tested and proved the iodide of potassium, sometimes called hydriodate of potassa, I can confidently recommend it as the best remedy for that disease I have ever used, believing it, if properly used, a specific for that disease, when the disease exists simply—that is, unconnected with other and perhaps more active ailments. The dose may be from ten grains to half an ounce. I have never given over one scruple. The dose I prefer as a standard is twelve grains, given, if the disease be bad, twice a day, otherwise once a day; dissolved in a spoonful or two of warm water, and put into a handful or two of bran, which the animal will lick up readily. The best time to give it is between meals, say some two or three hours after feeding. If in summer, let the cow remain in the yard over night, give dose early in the morning, letting the cow remain at least one hour after. I think the small dose I name preferable as it will cause no irritation, but if continued a week or two will gently and surely remove the disease.

Yours truly,

David Williams.

Springfield, Wal. Co., Apr. 3, 1859.

The Value of Leached Ashes.

A Western Agricultural paper says, "*thoroughly leached* ashes contain *no potash.*" I have noticed that ashes cannot be thoroughly leached of their potash, even by the application of hot water, as enough of alkaline salts has remained to affect the skin of my fingers. The presence of acids, or the action of the roots of growing plants, can alone extract all the potash from wood ashes. But as leached ashes contain, beside potash, all the mineral elements of plants, they cannot fail to be an excellent manure for all light and thoroughly exhausted soils. One of the best farms I ever saw in Rhode Island was brought up, from an exhausted barren sand that supported no vegetation, to clover bearing, by the aid of leached ashes alone. Milch cows and swamp muck, afterward, with the aid of clover, induced great fertility.—*Genesee Farmer.*

Fruit and Fruit Trees.

Two of the best farmers within range of our knowledge—one a resident of Coos county, New Hampshire, and the other of Orange county, Vermont—have communicated the manner in which they secure good fruit. It is thus: They dig at some distance from the body of some favorite tree until they find a root, which they cut off. The part disjointed from the tree is then turned up so as to appear above the ground. It sends forth shoots the first season, and bears, in a few years, fruit precisely like that upon the parent tree. Let those whose trees are decaying, or who wish to increase good varieties, try this experiment; it is but an hour's work.

Coffee—How to Make It.

The following is given as the genuine French operation of "getting up" coffee:

It is scorched in a hollow cylinder, which is kept constantly revolving over a slow fire, and not a grain of it allowed to burn. Secondly, it is ground very fine, and, thirdly, when it is to be used a portion of this is placed in a finely perforated pan or cup, which exactly fits into the top of the boiler, coffee-pot, or vessel you wish to use. Boiling hot water is then poured on, and it percolates gradually throughout, carrying with it all the essential principles of coffee. As soon as percolation is completed, the pan is removed, containing all the grounds, and then boiling milk is added to the infusion, and your coffee is made. In no instance is your coffee boiled, and this is one reason why the *cafe au fait* and *cafe noir* are so much admired by all who take them.

Ohio Valley Farmer.

Molasses Candy.

Dr. Cummings, of the Brattleboro' (Vt.) *Phœnix,* thus treats his readers to a recipe for making molasses candy:

"Take two cups of molasses, one of sugar, one table-spoonful of vinegar, a piece of butter the size of a walnut. Boil briskly and constantly twenty minutes, stirring all the time; when cooled enough to pull, do it quickly, and it will come white rapidly."

Use the above proportions, and follow directions, and you will have good candy.

Something Worth Knowing.

One day last week, while purchasing a lot of dried fruit, we discovered small pieces of sassafras bark mixed amongst it, and upon enquiry were informed that it was a preventive against the worm. It is said that dried fruit put away with a little bark, (say a large handful to the bushel,) will save for years unmolested by those troublesome little insects, which so often destroy hundreds of bushels in a single season. The remedy is cheap and simple, and we venture to say a good one.—*Lexington Flag.*

How to Keep Horses Fat and in Condition.

"If I were asked to account for my horses' legs and feet being in better order than those of my neighbors, I should attribute it to the four following circumstances: First, that they are all shod with few nails, so placed in the shoe as to permit the foot to expand every time they move; secondly, that they all live in boxes instead of stalls, and can move whenever they please; thirdly, that they have two hours' daily walking exercise when they are not at work; and, fourthly, that I have not a head-stall or rack-chain in my stable. These four circumstances comprehend the whole mystery of keeping horses' legs fine, and their feet in sound working condition up to a good old age."—*Miles.*

Patience.

"I remember," says the celebrated Wesley, "hearing my father say to my mother, 'How could you have the patience to tell that blockhead the same thing twenty times over?' 'Why,' said she, 'if I had told him but nineteen times, I would have lost all my labor.'"

THE TWO GREAT EVILS OF VIRGINIA AND THEIR ONE COMMON REMEDY.

[There is not a more perplexing problem, nor one more difficult of satisfactory solution than the adoption of some feasible, humane, and just method of disposing of the free-negro population in the slaveholding States. That free negroes are already a nuisance in every neighborhood infested with any appreciable number of them, and that their presence among our slaves "operates injuriously" to their "morals, happiness, and contentment," is patent to the experience and observation of all. That the increase of the evil will be in the inverse ratio of the growth of population and the relative decrease of the means of their obtaining an honest livelihood is equally apparent. Hence, the obvious necessity,—by a early forecast,—of considering the best mode of applying some timely, safe, and judicious remedy. In this view the suggestions of our correspondent are entitled to a calm and deliberate consideration. They present the outline or general features only of his plan, as he has wisely withheld the minuter details, until comparison of opinion and the full discussion of the subject shall more clearly develop and establish the principles upon which the measure for abating the nuisance shall proceed. We will only add, in favor of the immediate consideration of the subject, that the longer the application of the remedy is delayed, the more harsh and summary is it likely to be, when under the aggravated pressure of the evil, public sentiment shall be thereby aroused and excited, to decisive action.—Ed. So. Planter.]

To the Members elect of the General Assembly of Virginia:

Gentlemen:

The selecting of this time, in advance of your legislative service, to ask your attention to an important subject, is not without a sufficient reason. As legislators, you are as yet disengaged and at leisure. There is now nothing in operation, (as will be from the first moment of your meeting together at the Capitol,) whether, as in some cases, of public business engrossing and monopolizing all your time and efforts for particular services—or, in others, the calls of social enjoyments and pleasures—or in other cases, of the too seductive claims of indolence and dissipation—which hereafter may be like to prevent your carefully listening to and considering any novel or troublesome scheme, which may be conveniently passed by and dismissed. Therefore I trust, as well as earnestly entreat, that you will permit me to direct your thoughts, for a short time, to the consideration of the very grave matters of public interest on which I shall presume to address you. The time which you may now conveniently give to individual reflection on the matters to be suggested, in advance of your meeting together for joint action in legislation, will the better enable you to come prepared to discuss and reason upon this question, and to decide discreetly and judiciously, and for the best interests and greatest benefit of the commonwealth. Even if my opinions and propositions of reform shall be deemed crude or impolitic, or unworthy of being adopted, still they may serve the more humble, yet, not the less useful purpose, of inducing those who have more wisdom, and also the power to act, to study the general question; and, by suggestion, even though indirect, my attempt may cause some of you to devise, and all to concur in enacting, some better plan than mine for moderating, if not entirely removing, the two great and growing evils which I shall attempt to encounter. These are, 1st, the nuisance of the class of Free Negroes, as now existing and increasing in Virginia, and, 2d, the attempts, and partial success, of Northern Abolitionists, in seducing our slaves to abscond, and assailing and endangering the institution of negro slavery. The first of these is the great domestic evil of Virginia, caused by her own erroneous legal policy of permitting the emancipation of slaves. The other is the great foreign evil and danger, of very far more weight and importance to Virginia, and to all southern interests, than the former, or than all other public evils. I shall attempt to prove that in one and the same new measure of policy will be found the effectual and complete remedy for both these very different evils. The established policy of banishing from the territory of Virginia, (with the alternative penalty of enslavement at home,) all the free negroes except the industrious, self-supporting, and worthy, will not only effect the direct purpose of removing all the worst features of that existing nuisance, but also, indirectly, will hereafter effectually prevent all the important and dangerous operation and influence of northern abolition and incendiary action, which has been, and can now be, exerted upon the south, by the hostile anti-slavery people and states of the North. This latter and indirect effect of the proposed new policy will be far more important and valuable than all the direct benefit in view, of merely abating the existing nuisance of the presence of the worthless free negroes. Yet, I fear, that the novelty of the proposed remedy, as a preventive check to the hostile action of anti-slavery fanatics, is likely to prevent my reasoning from receiving the respect of an attentive hearing.

The consideration of the secondary and indirect influence and effect (on the hostile and fanatical northern states,) will now be suspended, and postponed for the treatment of the proposed policy, as the direct means for removing the nuisance of a free negro population.

THE FREE-NEGRO NUISANCE, AND ITS PROPER REMEDY.

It is not designed here to discuss the expediency or propriety of negro slavery as a general question—nor any of the minor points of the general proposition. I do not address any but approvers of the existing institution of negro slavery. For all these, as for myself and my designed deductions, I may assume as premises, already sufficiently proved, and fully admitted, and requiring no further argument to sustain, the following preliminary propositions:

1. That the institution of negro slavery, as existing in Virginia, is a great public and private benefit, and its integrity and security ought to be effectively defended and maintained:

2. That the negro, (with very few exceptions to the general rule,) is naturally of inferior intellect, and incapable of self-government and guidance; and that enslavement is his proper and normal condition—and enslavement to the white man, as in this country, is his most useful and happy condition:

3. That the emancipation, heretofore, of negro slaves, has generally operated injuriously to themselves and their descendants—to the morals, contentment, and happiness of the remaining slaves, and to the interests of their masters—and also to the detriment of the great and common interests of the people at large.

Every negro in this country, or his or her ancestors, came in as a slave. Every negro, legally free, has reached that condition by his ancestors or himself having been emancipated by a former master. In latter times, thousands of individuals have become illegally released from slavery, by absconding, (and mostly by being induced and aided by northern abolitionists to abscond,) from their masters, and escaping to and being protected in the northern states. But the actual present condition of every free negro in the United States has been produced in one or other of these modes, subsequently to the previous and legal condition of slavery of the individual, or of his or her ancestors. Thus, the free condition of all negroes in this country is novel or superinduced, artificial, and abnormal—and contrary to Nature and to general expediency—and repugnant to the well-being and happiness of the class of freed-negroes, as well as of every other class of the the whole community. The great political problem which is required to be solved, is the recovery of the free negroes from their false position in this slave-holding community, or their removal beyond its limits.

There can be no question of the general truth, that the free negroes, as a class, or the far greater number of the individuals, are ignorant, lazy, and improvident,—poor if not entirely destitute of property—and altogether careless, or otherwise, incapable of improving, or rising above their very low condition. Very many are drunkards, and more are partly supported by petty thefts and other violations of law, or of morality. It is admitted that there are many of better habits—and a few who are industrious, provident, and even worthy and useful, though always inferior members of the community. But, taking the whole together, the injury to the community, from the presence and offences of the more numerous worthless and vicious of the class, far out-weighs all the benefits which have been, or can be, derived from the industrious and useful members.

The early emancipations of slaves in Virginia, as in other states of the Union, were induced by the mistaken kindness and benevolence of the owners—who supposed that they were rendering benefit to the slaves thus converted to free men. Founded on the general and false opinion of the natural equality of the black and white races, the sickly anti-slavery philanthropy became prevalent in England and in France, and was extensively propagated in this slave-holding country. Under such influences, many slave-holders, (and not a few of these had been among the most neglectful or cruel masters,) when preparing for death, sought to relieve their consciences, and smooth their passage to heaven, by emancipating their slaves. These acts of supposed piety, in dying sinners, were induced and encouraged by their religious guides in many cases—and were especially prompted by the writings and teachings of the negrophilist school of that time in England, and also in this country. The soil was then especially favourable to the germination of such seeds. For slavery had come to be generally considered as an economical and political evil, by a large proportion of the more intelligent slave-holders in Virginia. It was not until after the abolition-fanaticism of the northern people and states had become both active and malignant, and after Professor Dew's excellent "Essay on Slavery," (the first important defence of the system offered in modern days,) had been published, that the revulsion began. At the present time, there are few intelligent and well-informed persons in all Virginia, who do not deem negro-slavery to be, in every respect, a beneficial institution.

The death-bed or testamentary emancipations of negroes were not formerly, as mostly now, confined to weak-minded old women and men, who have been seduced to these acts by the teachings of northern anti-slavery apostles, or agents of the Colonization Society—the end of the latter influence being emigration, voluntary or forced, to Liberia. Many men of strong or brilliant intellect formerly participated in the great error—and also sin, and cruelty, it might justly be termed, if the good and humane motive did not serve to excuse the wretched effects. The sound and practical mind and judgment of George Washington, and the powerful intellect of John Randolph—endowed almost with intuitive perception of political truths—did not save them from falling into, and acting in accordance with this great error, and thereby producing all its miserable results, to the objects of their designed favor and benevolence.

There is no doctrine of the modern science of political economy more firmly established, and generally admitted, than the proposition that the population of a country will increase with, and to the same extent, and be limited by, the means for subsistence. So long as these means exceed the necessities of the inhabitants, the population will increase—faster or slower, according as food may be of easy or difficult attainment. When population has reached the limit of the supply of food, it must cease to grow. If not restrained, in advance, by prudential and preventive checks, the excess of population, without sufficient means for subsistence, must perish by misery, if not by actual starvation. Even in countries far advanced in improvement, and which are yet prospering, and growing in population in general, (as England,) the lowest and most destitute classes, if considered alone, have already, in population, reached, and passed, the limit of subsistence—and therefore these lowest classes are continually diminishing in numbers. But this diminution is not observed, and made evident by statistical reports, because all the places vacated by death are continually supplied, and more than supplied, by new recruits, who have sunk to this from their former more elevated positions in classes generally prosperous. Thus while the paupers and day-laborers of England, if left to be supported from their own resources only, (or as if there were no law for the compulsory support of the poor—) would be continually and rapidly losing individual members, by death, and very much faster than the vacancies are supplied by births in the same classes, still these destitute classes are more than kept up, and even continually increased in numbers, because absorbing still more individuals from other and higher classes.

Now if all the present individuals of the most destitute classes in England could have put on them, for distinction, a mark obvious to the slightest observation, and this mark was also affixed to all their posterity, it would be seen clearly that the whole marked number was regularly and continually decreasing, dying out, and disappearing, because of suffering from hunger, and every other kind of misery, consequent to poverty and destitution. It is true that a few members of even the most destitute class, or some of their children, would be so meritorious and fortunate as to rise above their condition, and to prosper, and become removed to richer classes. But when counting in these few exceptions to the general rule of destitution, ending in extinction, it would be found that the whole original number thus designated as the most destitute, would be thenceforward constantly decreasing—and for the greater part, would be passing on to intolerable suffering, and next, by death, to extinction. The poor-law system of England, which provides means of subsistence from compulsory public contributions for those who cannot subsist by their own labor, serves to retard this final result of the extremity of want, and in some measure to moderate the rigor of the natural limit of subsistence. But the same system, by operating to encourage marriages and thus to increase the excess of population, even increases and exasperates the evils of poverty, and, in the end, will cause suffering and death to many more miserable wretches than it had served to relieve in earlier cases.

In our younger and more plentiful country—where as yet abundant subsistence is to be obtained by a very moderate exertion of labor—the general evil of population pressing upon the means for subsistence is still far remote. But the same laws of food and population operate here as in England—and when causes are of equal power, there will be like effects produced. With us, though, in the general, food is abundant, and population deficient, and both are like to so continue for many years, for the community taken as a whole—still, even now, with the most destitute class, the means for subsistence are deficient, and population is checked, and limited, and in cases of many families, absolutely diminishing. And the most destitute class in both the southern and northern states is that of the free negroes. Further, this class, in their color, have such a manifest and also hereditary mark of distinction as was supposed above, but which is impossible in any other case of a people of one race. This class, in the northern states, is much the most miserable and destitute; and if the number in the north was not continually and largely added to from southern slaves, by new emancipations, and by fugitives, there is no question but there would be seen, in regular progress, a rapid diminution of the whole class, because of the deaths caused by vice, destitution, and misery, greatly exceeding the number of births. And even in the southern states, where the means for subsistence of free negroes is yet abundant for all the industrious and frugal, still this class, taken together, is also our most destitute class, and to the increase of which the limit, of subsistence is already an important check, though not yet sufficient to cause general and absolute decrease of the whole class. In the northern states, the means for subsistence, whether honest or dishonest, are more difficult to be obtained by the negroes, in competing as they must do with numerous whites, not less necessitous, and as much degraded in position, but far more industrious, or energetic and skillful than the negroes. They are met and obstructed by such competition in every department of menial or other low service, or temporary and irregular jobs, which only are sought by free negroes, who avoid all continuous and laborious work. There, as in the south, the earnings of many of this class are eked out, if not exceeded in amount by petty thefts. So much greater is the temptation, or pressing necessity, for resort to crime, in the north than in the slave-holding states, that in 1850, one free negro of every 65 in Massachusetts was a prisoner, or convict, for crime, when of the same free negro class in Virginia, poor and vicious as it is, there was only one such convict for every 572.*

* See "Compendium of the 7th Census" (official document,) pp. 83 and 165, for authorities for the following facts, for 1850:

Free negroes "in Jails and Houses of Correction—"

In Massachusetts 97 in 9,064 free negro population, [or one prisoner to every 93½.]

In Virginia 24 in 54,333, [or 1 prisoner to every 2,264.]

Free Negro "Convicts in Penitentiaries—"

Massachusetts, 42 [or 1 felon for every 215¾ free negroes,]

Virginia, 71 [or 1 felon for every 765 free negroes.]

If adding together the free negroes "confined in Jails and Houses of Correction" and free negroes, felons,—"Convicts in Penitentiaries," for each of these states, there will appear these averaged numbers and proportions:

Of Massachusetts, prisoners and convicted felons, 139, or 1 in 65.

Of Virginia, prisoners and convicted felons, 95 or 1 in 572.

Which shows, that in proportion to the respective population of this class, there were very nearly 9 times as many free negroes in Massachusetts imprisoned for criminal offences, on charges, or convicted felons, (excluding those punished by death,) as in Virginia for the same year.

In the south, there is, at present, not only a better field for the labors, and more sure rewards from the honest industry of the free negroes, but also much better chances for them to live partly or wholly by depredations on the property of the whites, with but slight chances for detection. This is owing to their small comparative numbers, and to their being interspersed among the much larger slave population. The free-negroes serve to induce, to conceal, and to aid thefts by the slaves—which thefts, on their masters' property, slaves have ample facilities to commit, but which they would not be tempted to commit, or be able to secure the fruits of, but for the assistance of free negroes as receivers and conveyers. Also, in their comparatively small numbers, the free negroes, among a large slave population with which they are closely connected, have increased facilities for direct thieving, and the concealment thereof. Further, every male free negro prefers to have a slave for his wife, and will be so provided if permitted by too careless indulgence. In this manner he will not only have his wife and children supported by the owner, and a lodging provided for himself, but much of his own food will be obtained from his wife, and directly or indirectly, to the loss of her master. All these circumstances serve to make it easy, as yet, for free negroes to subsist in the slave-holding states; and they serve to retard the full operation of the law of want and misery restraining all increase of population—which already operates on the more destitute free negroes of the northern states, and the destitute whites in England. But, in the fulness of time, and with the diminution of means for honest subsistence, (and without a change of policy,) we shall have, in Virginia as large a proportion of destitute sufferers, and of criminals, of this class, as now are in Massachusetts.

There are still other reasons for the greater mortality of free negroes than of other classes. It is their general and strong preference to reside in towns rather than in country places, because in towns they can best find demand for menial services, and the light and irregular labor which only they are disposed to undertake; and also social intercourse with many other idlers of their own class. City life is more unfavorable to the growth of population, even for the higher and best provided classes—still worse for the poor, and worst of all for free negroes. In towns, comparatively but few of the males of this class choose to burden themselves with the support of a wife and children. The males are more apt, and have more facilities, than in the country, to indulge in habitual intemperance and debauchery. The young females are rarely chaste, and in many cases the mulattoes are habitual prostitutes. Nearly all the individuals are, or the children will be, of mixed blood. And though this kindred to the superior race brings with it proportional increase of intellect and intelligence, yet under these circumstances, there will also be with this benefit, as much increase of vice, debauchery, and the consequent penalties, disease, self-neglect, and death. It may well be understood, that in cities the growth, or continued succession, of the free-negro population must be especially checked—and that it will there diminish much more rapidly than elsewhere, or than would any other class of population. In addition, it is an established fact that mulattoes are generally of more feeble constitution than either of the parent races of unmixed blood; and the change in succeeding generations, to children of mixed blood, will the more rapidly serve to diminish the numbers of the free negroes residing in towns. All these causes of decay, and gradual extinction of the free-negro class, for obvious reasons, are more operative in large than in small towns, and very much more now in the the towns of the Northern than the Southern States.

It would afford very interesting and instructive information on this subject, if it were required, and reported, in the census tables of the free-negro population, how many of each locality were born free, and how many had acquired their freedom subsequently. It is obvious to the statistician, that, without preserving this necessary distinction, as well as knowing (more particularly than has been yet reported,) the places of birth as well as of residence, the census reports of this class are worthless for showing the true measure of increase by natural procreation in any localities, or the absolute decrease in other localities. If these facts were ascertained and noted in the census reports, it is probable it would be manifest that even now the deaths of this class exceed the births, and that the numbers are decreasing in most of the larger Southern towns, and that the decrease is general in all Northern towns, and also the total free-born negro population of all the older Northern States. And it would then still more plainly appear, that the actual increase (as appears by mere enumeration,) of this class, throughout all the non-slaveholding States, is due, not in the least to procreation, or excess of births over deaths, but to the continual ingress from the South of emancipated and fugitive slaves.

It is a melancholy reflection that any class of human beings shall be thus passing to final extinction. It is a repulsive theme, to reason and speculate on the consequences of such working of the stern law of population. And it may seem heartless to deduce, and present as compensatory benefit, any good or profitable results, from such condition of human degradation, vice, and misery. But it is an inevitable law, and operation of civilized life, and of dense populations, and especially of all town populations, that the lowest, the most improvident, profligate and suffering class, shall be decreasing by the excess of deaths over births—and this law is even less severe in its inflictions here, than in older countries, and where the perishing classes belong to the highest race. As such deplorable general consequences must occur, and are inevitable, it certainly is in some degree a countervailing benefit to the community, that in the towns of our slave-holding States, the lowest class, which in the general, is gradually thus passing to extinction, includes most of the free negroes of those localities; and in this manner, independent of any other more general and speedy legal measures for removing this class, that natural causes will thus continually be extinguishing the worst portions, instead of making the like destruction of the superior race, if occupying the same low position. And the proper consideration of this operation should add to other economical inducements, to permit our free negroes the free indulgence of their almost universal preference, to seek residences in towns. There they are more useful—their vicious propensities may be more effectually restrained (by the general policy to be here advocated,) and, taken as a whole, the entire class in each town, will be mainly the diminishing and perishing class, and passing on to extinction.

By all the different operations, both of increase and decrease, the number of free negroes in the United States, in 1850, (the last census,) had reached 434,495. Of these, 198,328 were in the non-slaveholding States, and 236,167 in the slave-holding States. Of these, Virginia had 54,33; and therein so far exceeded all the more Southern States, that she would deserve the title of being the free-negro State, but for Maryland's much stronger claim to that bad pre-eminence, and deplorable condition. Maryland had, in 1850, 74,723 free negroes, to 90,368 slaves and 417,943 whites. In that commonwealth the emancipation feeling has done more harm than in any other holding slaves, and it is not yet either dead or inactive. Besides all the wealth that Maryland had previously sacrificed, in converting so many thousands of useful slaves to lazy or worthless free negroes, and then leaving them as abiding nuisances on her territory, and in the midst of the community, she has, within the last 27 years, in different modes, contributed, to the end of emancipation, more than half a million of dollars, through the Colonization Society, and its contemptible offspring, the republic of Liberia. Delaware, with only about 2000 slaves remaining, I deem as united in feeling and (supposed) interests with the non-slaveholding States, and should be counted as such—though her 18,073 free negroes were stated in the above enumeration as belonging to the slave-holding section of the United States.

The free negroes of the slave-holding States, in obedience to the causes stated above, are still increasing by natural procreation. In addition, they receive accessions from new emancipations in some cases, where still permitted as exceptions to general prohibitory laws—or by evasions of the law. This is especially the case in Maryland and Virginia, where the evil is already at its greatest height. Though at this time not one person in a hundred holds the former generally prevalent opinion, that the emancipating of a slave is a virtue in the master, or a benefit conferred on the slave, yet there are still a few owners who thus act, to the detriment of the slaves of their neighbors, and of the commonwealth. Since the laws of Virginia have prohibited newly emancipated slaves from remaining in the State, when that prohibition cannot be avoided, or evaded, (as has too often happened,) the usual present course is to send the freed slaves to Liberia. This course, when carried out, at least prevents so much addition to the magnitude and increase of the nuisance of the free-negro population. But in other respects, the evils of emancipation are not lessened—and in regard to the future condition of the freed negroes, the evil is greatly increased.

Dismissing from consideration the Northern States, and also Delaware, as being essentially Northern and non-slaveholding, there will remain 210,055 free negroes to all the other 14 slave-holding States. In regard to these, and to the States in which they reside, like interests are involved, and the same opinions and State policy ought to govern and prevail. But as our present business is only with Virginia, I will generally restrict my present remarks on the evils in question, and on the remedy to be proposed, to this commonwealth alone.

The free negroes of Virginia, in 1850, amounted to 54,333. Now, they doubtless have reached the number of 60,000—which will be here supposed. Half of the whole, or 30,000, may be adults, or if younger, are such as ought likewise to be fully self-supporting—leaving 30,000 for young children, or aged or infirm adults, incapable of full self-support. Of the 30,000 capable of self-support, it will be a liberal allowance to suppose that as many as one-sixth, or 5000, are honest, sober, industrious and provident, and otherwise are worthy individuals, and productive and useful members of the community. According to this estimate of the deserving, there will remain five-sixths, or 25,000 persons, capable of self-support, who are either indolent, intemperate, of vicious habits, or subjects of criminal justice—and who, either thus, or for other causes, are not self-supporting by honest means, and are useless, injurious, and costly to the interests of the community. The young and infirm 30,000 may be divided into like proportions, according to the habits of their parents, so that one-sixth will be deemed supported by honest industry, and five-sixths, either partly or wholly, at the cost of the community. Thus, if 10,000 are sustained by honest labor, or honestly acquired property, and are either working usefully and profitably for the good of the community, or are in training for such future usefulness, there are 50,000 others who are now, or will grow up to be hereafter, of opposite habits, and who are, and will be, more or less costly, and nuisances to the community. This general condition of this class cannot improve, under their existing circumstances—and on the contrary, will change, with the progress of our country, to a still worse moral condition, and until it will become intolerable. Consider the present burden on the capital and industry of Virginia, in having to support, partly or wholly, 50,000 persons, that now compose this vicious and worthless, or destitute population! If all the various items of cost and loss were duly estimated, it is likely that these 50,000 idlers and thieves are as expensive to the commonwealth as it would be to pay and maintain a standing army of soldiers of half that number.

Although the free negroes are much worse off, even now, than our slaves, still their freedom seems to cause discontent to the slaves. They see among them other negroes, in no respect superior to themselves, in qualities or conduct, in possession of what they deem a great privilege, the unrestrained indulgence of indolence—while their want of consideration prevents their duly estimating the cost, or consequences, of such indulgence. It is the general characteristic of the negro race to prefer idleness to labour, and rest to profitable exertion, no matter how well labour and exertion may be rewarded—and to make the least possible provision for future wants. If whites were so enslaved, they would eagerly covet and strive to obtain their freedom, mainly for the purpose of labouring for their future aggrandizement, if such rewards of labour were available. The negro slave, if not seeing other negroes free, would scarcely think of his servitude as a hardship. But with this example of exemption from labour always before his eyes, he is taught to desire also to be free, and to be discontented and unhappy because he is a slave. He does not desire freedom to labour for himself, but to be idle. As a general rule, negroes will not labour, unless when under the immediate pressure of want, if free, or as slaves, under the direction and compulsion of a master. And because of their feeble intellect and will, the latter mode of compulsion is the most beneficial for their own interest, as well as for all other interests.

The State of Virginia is not the author of this great evil of freed negroes, nor is it blameable for the existence of the nuisance, otherwise than by the former and long continued indulgence of the legislature in failing to forbid every act of emancipation by the individual owners of slaves. In their conferring on their slaves the injurious gift of freedom, the former masters had no right to damage their country and its citizens—still less if the damage is to continue and increase through all subsequent time. And in receiving the gift of freedom, the former slaves thence derived no just claim that the Commonwealth should submit to suffer detriment and great injury, either for the present or the future. The experiment of permitting the subsequent residence of the emancipated negroes, and of their posterity, has been long and fully tried, and the results have been found to be extremely injurious to the Commonwealth. And this injury is suffered by the community without even the consolation of believing that the sacrifice has produced any benefit to the freed negroes—who, as a class, have thereby been sunk still lower in the scale of morals, habits, and even physical comfort, since they ceased to be slaves. In this view, the Commonwealth is under no moral obligation to continue, for all future time, to bear this grievous and gnawing burden. There is, clearly, a right of self-defence, to be exercised in abating this great nuisance—even if it could be done only by the simple and speedy remedy of requiring of all the members of the class to make their option between leaving the territory of Virginia, or, if remaining therein, of being re-enslaved. But there is no need of adopting so summary and stringent a procedure, for which public sentiment is not prepared, and which would shock many good people as a measure of monstrous injustice and oppression. This general and uniform policy has already been proposed and defeated in the legislature of Virginia. If again attempted, it will be again defeated. This certain prospect of failure is a sufficient objection to this plan—and therefore it is unnecessary to discuss its theoretical expediency or policy, or its accordance with, or departure from, the requirements of justice or benevolence. On other grounds, of punishment for crime, or of police measures to prevent crime, the desired ends may be virtually attained, as to all the vicious, worthless, destitute, and suffering free negroes. And if the remedy extends no farther at first, society will be greatly benefitted, and there will be left but a small part of the present burden, and that part not to be continued very long.

I will now proceed to consider the means for remedy, which appear to my judgment the most politic, and divested of all unnecessary and avoidable hardships, and yet effectual for the ends desired. The main and essential features of the plan only will be stated and discussed. It would be a useless waste of time to go into details, or to propose the modes of effecting minor measures, or of avoiding minor difficulties and objections, all of which would be proper and manageable subjects of legislative enactment, or details of a law made to carry out the general policy of removal, or abatement, of the great nuisance.

But first, let me premise that though the enslavement of great numbers of the now free negroes, for crime or misconduct, is a principal object of the general plan, I do not deem enslavement to be a proper substitute for punishment, or satisfaction for grave criminal offences. But statesmen, or others having power to direct the public mind, who differ with me in opinion, and deem slavery of negroes to be a grievous hardship, may, by a different course of reasoning, and of designed policy, arrive at the same practical end, at which I aim. If we shall agree, though upon different premises, on the propriety of subjecting all free negro criminals, who would otherwise undergo confinement in the penitentiary, to perpetual slavery, we shall, in that one respect, have agreed to a very important measure of public reform. As a punishment for crime, perpetual slavery is as legitimate as any other mode—and cannot be justly objected to by any, unless because of being too light, or too severe, (as supposed,) for the offence so punished.

As a general question, applied to the whole class of free negroes in Virginia, the change from their condition of freedom, degradation, and general want, to that of slavery, would be no cause or means of physical suffering, or punishment. Still less is it a punishment to subject a felonious free negro, as usual under our laws, to confinement for a limited time in the penitentiary. For his physical wants, the change is a great improvement of condition. Instead of his previous life of indolence, with scant and poor food, and without a bed, or a home in many cases, he is required to labour only moderately, is fed abundantly, and on better fare than he had ever enjoyed before, is comfortably sheltered and lodged, and well nursed and cared for in sickness. The only punishment suffered, is the wholesome restraint from evil-doing, and from being idle, and roaming at large. For the negro, however unfit for freedom, is not the less desirous to enjoy what he deems its benefits—which are unlimited license to be idle. But even with these grounds of objection felt to penitentiary confinement, the free negro convict is, in almost every such case, much better off than when at large, and before being charged with crime. If our present very bad system, in this respect, shall continue unchanged until the difficulty of gaining bread both by honest and dishonest means, shall be much increased, our posterity will have free negroes to commit and confess felonies for the purpose of obtaining, on very easy terms, the abundant and good fare supplied to convicts in the penitentiary. They suffer no increase of degradation of character or position, by having undergone such conviction and confinement, as would occur to persons having previous good reputation, or capable of subsequently acquiring any, by good conduct. In short, penitentiary confinement for free negroes, as punishment for crime, is a ridiculous farce. Indeed, it seems not otherwise for white convicts, if they would be in straitened circumstances if released. Most of those persons whom I now especially address, saw during the last session of the legislature, the penitentiary convicts at work on the Capitol Square. Such lazy and slow labour never came under my personal observation but upon one other occasion, which was in another department of the public service. This was the work of the ship-carpenters, employed on the last built war-steamers at the United States Navy Yard in Portsmouth, Va., and who, I suppose, were then receiving not less than two dollars a day for labour much more lazily performed than that of the penitentiary convicts. Of both these sets of labourers, the bodily exertion did not seem to my view greater than needful to preserve health and good appetite,—and scarcely enough to make them fully enjoy the luxury of rest or sleep—or to cause our convicts to care about obtaining pardons from the Governor,

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It is not as sufficient punishment for grave offences, (falling short of the death penalty,) but as an accompaniment of other previous punishments, such as solitary confinement, hard labour on bread and water, whipping, branding, and mutilating, &c., (formerly used in Virginia, and still in some other States,) that I would propose perpetual enslavement for all free negro convicts. This would at once establish a policy which would keep out of the comforts of living in the penitentiary, and save to the Commonwealth the expense of support therein, of all the free negroes, who make up 72 to 100 of the native-born white criminals, confined. Immigrants, or sojourners from the Northern States and from Europe, make up nearly half, or 94 in 222 of our white convicted felons.) The converting of all the free negro criminals, for every grade of crime, to slaves, would generally serve to restrain them from future crimes, and render useful and profitable, by their labour, all of the now worst and most worthless of their whole class. Every minor offence, now subject to corporal punishment, should be commuted to banishment from Virginia, with the alternative penalty, for disobedience to the first sentence, of enslavement.*

TO BE CONTINUED.

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* According to the latest report of the Superintendent of the Penitentiary to the Legislature of Virginia, (Doc. 13,) there had been confined therein of convicted felons, from the first establishment of the Penitentiary in 1800, to Sept. 30th, 1856, of whites, 2571, and free negroes, 839.

On Sept. 30th, 1856, (the last day included in the report,) there were then confined felons as follows:

Whites, natives of Va.,	128	To'l wh'ts, 222.
" natives of other States and of Europe,	94	
Free negroes, nat'vs of Va.	88	92
" " other States,	4	
Total number of felons then confined,		314

These figures show the following proportions:

The total of free negroes (92) to total of convicts, (314) was 1 to 3.42

The native-born free negroes, (88) to total convicts (216) was 1 to 2.45

By last census (for 1850) the free negroes made 54,333, and whites 894,800, total 949,133 free population of Virginia. The population

On Securing Sweet Potatoes and other Root Crops.

The following method of securing that delicious esculent, the sweet potato, has been communicated by a friend and correspondent, who has tested its complete efficacy,—in his careful hands,—for sixteen years. His recommendation with those who know him would be regarded as the very highest authority.

His judicious remarks about the propriety of an equal care to provide suitable means for the preservation of this crop, as every "*sane*" corn-grower would exercise in providing a crib for the housing and safe-keeping of his corn, suggests to the provident, careful farmer, the importance of getting up suitable places for storing and preserving every useful kind of root crop. He should do this, not as a place of security only, but as an incentive to the larger cultivation of them, for the benefit of his stock in winter, and the improved economy of his husbandry, for it is undeniably true, that their cultivation is oftener omitted for the want of the means of keeping them securely than from an undervaluation of them as adjuncts to the grain and ordinary provender for the winter keep of stock.—[EDITOR.

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was 1 free negro to rather less than 17½, of the total free (white and black) population. Thus, the free negroes in proportion to the total number of convicts, were as 1 to 3.42, and furnished more than five times their equal proportion of convicts; and counting native-born convicts only, of both whites and free negroes, the latter were 1 to 2.45 of all, and furnished more than seven times their numerical proportion of the whole number of both.

Gov. Smith's annual messages to the Legislature of Virginia present other striking facts, showing similar evidence of the greater amount of crime of the free negroes. In the message of 1846, the following statements were made from official statistics:

"In 1840, the convicts in the penitentiary were 107 whites (including foreigners,) and 82 free negroes. So the class of free negroes (then 49,842,) constituting only one-sixteenth of the total free population, contributed largely more than two-fifths of the convicts. Of slaves, (448,987 in 1840,) the same year, there were but fourteen transported, [for felonies, which would have been punished by Penitentiary confinement, if committed by free persons.] The free negroes, constituting only about one-tenth of our whole negro population, perpetrate about six-sevenths of the felonies committed by the whole of that class."

(Message of 1847.) "The free negroes, constituting about one-twenty-fifth of our entire population, [of Va.,] perpetrate about two-fifths of the crimes of the State."

The message of 1848 showed from the Penitentiary Report for that year, that "the free negro perpetrates, at least, ten times as much crime, in proportion to numbers as the white man." . . . . "Of the 81 [free] negro convicts now in the Penitentiary, ten are there for the crime of stealing and enticing away slaves."

For the Southern Planter.

TAKE CARE OF YOUR POTATOES.

It will be remembered that a method was proposed for wintering roots, and especially sweet potatoes, in the last volume of the Southern Planter, (page 721,) which being founded on correct principles, and, what is of more weight, having stood the test of repeated experiment, promised important results to the growers of that valuable root who might think proper to adopt it. As far as information can be obtained, it has, as usual, succeeded, and will probably never fail if the potatoes are sound and ripe, and the plan duly carried out. Under ordinary circumstances it is one of the cheapest modes of root-storage that can be devised. In any dry outhouse or vacant attic or loft, make shelves of rough boards, light rails, or any convenient material, using dry chaff, saw-dust, or any non-conductor to exclude frost. The great ends attained by the proposed plan, are the reduction of *pressure*, and the thorough *ventilation* procured by the interposition of shelves or floors at vertical distances of about eighteen inches; if the shelves are so weak as to sag down and rest on the subjacent heap of roots, supporters should be introduced, or the benefits of the system will of course be lost.

The plan of bedding sweet-potatoes in the earth, (as recommended by an intelligent correspondent,) is well adapted only to very dry soils in dry seasons; in wet localities, or those provincially termed "slashes," potatoes thus exposed, rot almost invariably. No plan of storing crops can be considered cheap which does not effectually exclude the weather as well as the depredations of rogues. Would a corn-grower to the amount of 100 barrels per annum, who undertook to dispense with the corn-crib, be thought sane? True economy would recommend something more than the temporary fixtures above indicated. Those who have provided cheap houses or barns for roots, accessible in all conditions of the weather, but only by the key of the owner, can never be persuaded that the old, unsafe, and wasteful system is a cheap one.

J. L. D.

Without danger, danger cannot be surmounted.—*Publius Syrus.*

The Southern Planter.

RICHMOND, VIRGINIA.

Stock Raising.

In this age, so marked by improvement and progress in most of the pursuits of man, it behooves the agriculturist to present as many evidences of good taste and skill in his profession, and as thorough a knowledge of what is best calculated to advance his own interests, and promote his happiness, by the thorough cultivation and fitting out of his farm and "surroundings," as we meet with amongst the cultivated, liberal and intelligent of other professions. That agriculture is entitled to the dignity, and honor of a science, no man may doubt: or at least if he does, he proves his own incompetency for the calling, and affords the almost certain guaranty of his own unworthiness of the name and success of farmer.

Certain principles have been laid down for draining and ploughing, and fertilizing our lands, deduced from the experience of our predecessors, who represent not speculative theories only, but a large amount of practical knowledge, the matured fruit of careful study, diligent labor, patient reasoning, and close observation. This gives them a right to claim attention and credence from all those persons to whom their instruction may be presented. Nor have we had instruction offered us upon the subject of the land alone. Thanks to the interchange of opinion and experience between stock raisers of every kind—effected through the columns of various agricultural journals of many nations, we have had the qualities, habits and aptitudes of almost every class of domestic animals, so thoroughly investigated, that we have very little difficulty in improving our stock, by following the advice which has been so often and freely offered. For our own State we can say that, although in every quarter, she evinces an interest in, and disposition for improvement in agriculture, still in many places, no interest whatever is felt in the improvement, or rearing of animals.

The period is not far distant when we shall be forced, in self-defence, to pay far more attention than we have hitherto done, to this subject, or we must become dependent entirely upon our neighbors of the "far west" for a very large amount of what we should raise at home. Already do we pay an immense amount annually, into the pockets of our Kentucky brethren for mules and horses. Nor is Kentucky the only State that finds a ready market with us for surplus stock, but the same may be said of Indiana, Ohio, and others. If we want an extra fine horse of speed and action, it is our custom to buy him from New York. *If we could not raise as fine animals with our resources, as can any of our neighbors,* then it might be good policy to submit to the present condition of affairs—but we appeal to every candid Virginian, if we have not had at our own stock exhibitions, as fine samples of Domestic animals of *every kind* as were ever raised on any other soil? With as great a variety of soil, capable of producing every kind of forage for stock, as is possessed by any State in the Union, why should we not depend upon ourselves for the stock we are annually buying in large numbers from breeders beyond our own borders? The improvements in machinery have been so great within the past few years, that we are almost compelled to "double teams" on almost every southern farm, while the high price of labor makes it economical and advisable that we should in all practical cases, substitute their use for manual labor. The necessity for following this course has been felt sufficiently strong to induce farmers to pay prices for mules which (with the present prices for farm produce) are almost ruinous—good animals bringing in our market from $160 to $200 each, which could some years since have been bought at from $60 to $100. While the demand for animals of this description has rapidly increased, the home supply has rapidly diminished—very few comparatively of our farmers taking any interest in stock raising, while many are of opinion, that they can purchase them cheaper than they can raise them. Purchasers of cows too, are beginning to find out that it is cheaper to them, and less troublesome, to pay a good price for a good milker, than to buy for a few dollars an animal which will give only a few pints of indifferent milk daily. Cows which will give from 3 to 6 gallons of milk a day, are in demand and sell readily at prices varying from $40 to $100—according to quality. For our supply of such animals we pay liberal prices—sufficiently liberal at all events, to justify the breeding and rearing of improved dairy stock, without much risk of loss on the part of any breeder who is commendably prudent and economical in his expenditures. We would not advise farmers to buy a large stock of thorough-bred animals at high prices for home use; but such a plan is by no means necessary for the improvement of the stock which each one may have on hand. These may be improved rapidly and steadily, by the careful and judicious selection of breeders—while the occasional purchase of a good animal for "crossing" is judicious and desirable. A very important fact to be kept in mind by those who wish to adopt such a system is, that their young animals of every kind, require attention, and care, particularly in the first year of their existence, "calves should not be knocked on the head by the butter stick," say all those who rear good cows. If size is expected or desired of an animal, or early maturity, it must be well fed and protected from inclement weather while young, and any man who has once tried the experiment of wintering cattle in a good stable, will be convinced of the economy of time and money, so far as he is concerned, and of the greatest thrift, comfort and improvement of his animals—besides the increase of bulk and value to his manure heap, which will be a sure result. We have never been able to understand how any man with any of the "milk of human kindness" in his composition, could allow his stock to suffer from exposure to all kinds of weather, without protection of any sort on his part. Such disregard of his own interests, and forgetfulness of the precept, "the merciful man is merciful to his beast," can only be looked for in the counterpart of the man who found this fault with his manager for buying leather for plantation purposes—"such a thing never happened before, sir, as the want of hides to make leather for home use since I have been farming. Before you came, I always had, on the ridge of my barn, enough skins of the cattle which died in March, to supply us with all the leather necessary for our use, without having to buy a pound." We may occasionally find among us, a barn whose ridge-pole bears testimony to the observance of a similar system of economy on the part of its owners.

We repeat, that in our own State we have as great a variety of soils, capable of as thorough fertility, as can be found in any State in the Union. That we can raise as fine animals among us, as ever grew to maturity anywhere, the exhibitions of Virginia stock at the agricultural shows held in Richmond, Petersburg, and other places during the fall of 1858, abundantly prove.

Let each farmer then imitate the example of his progressive neighbor, and make some improvement in his stock by the exercise of his own good sense, and generous care of his animals: or if he has no such neighbor, let him be the pioneer in a good cause, and by his persistent efforts, wise counsels, and kindly aid and encouragement to others, induce them to follow in his worthy lead.

We want to see the time come quickly, when our markets are to be supplied by home-made farm products, and the leaks in our pockets, caused by the western horses, mules, and hogs, and northern hay, may be effectually stopped. The interest in improving our lands is beginning to be so generally felt by farmers in every condition, that we think there can be no danger of its diminution: but we know that a large number of our farmers need a thorough rousing from their neglect of stock breeding, and we would earnestly call their attention to the subject, and beg each one of them to begin at once, on a scale commensurate with his means, to atone for any past neglect of the subject.

Dwarf Pears.

We mentioned the fine specimens of this delicious fruit, which had been given us by Mr. H. J. Smith, of Henrico county, in our last number. We have received from Mr. Wm. Smith, of this city, very flattering accounts of the yield of the Dwarf Pear trees growing in his garden, besides the additional pleasure of eating a part of one of his pears, which *weighed fourteen ounces* when plucked from its stem. Neither of these gentlemen raises trees to sell, and to give them "a puff" is no part of their desire, or our object, in calling attention to their fruit: but simply to remind our readers that "what has been done, can be done again," and if they can succeed in raising such fruit, that no reason exists why every farmer and gardner may not do likewise. A strong prejudice exists in the minds of many persons against the Dwark Pear, and much controversy has been the result of their introduction. Much of this war of words has probably been caused by dissimilarity of treatment of the trees, by the opponents in question. It seems to be generally conceded that the Dwarf Pear—growing as it does on so small a stem, and having roots, in its early stages, without much lateral expansion—requires to be "shortened in"—*i. e.*, the top should not be allowed to spread itself in a proportion too great for the roots. Consequently, these trees require more care than the majority of farmers are apt to bestow upon them, and the negligence of the owner is excused by crying out "humbug" against the tree.

Our own "settlement" is, unfortunately, too new for us to have yet a-while any fruit—so that we have to speak from the experience of other folks in this matter, and not our own.

One of Mr. Wm. Smith's Dwarfs, had on it this season *forty-seven pears of fine size*, all of which matured. He does not know what to call it, as he bought the tree from a Frenchman. The fruit looks more like a quince than a pear—is very large, and has a flavor strongly dashed with rose-water. Can any of our fruit-growers say to what variety it belongs?

"Pamunkey."

We return our thanks to "Pamunkey" for his communication, and hope he may be able to induce his friends and neighbors to follow his example. We confess it is a source of mortification to us, that the names of any of the *residents of his particular district of country*, are so seldom to be found in the pages of the "Planter."

We spent a very pleasant part of our past life "just there;" and when we left our old residence and friends behind us, we *brought with us* an interest in the improvement of the lands, and an affection and esteem for very many of the people, which we shall carry with us into the next world. While we appreciate highly the aid of all or any of our brother farmers in our efforts to advance the cause of agriculture, and to induce every farmer to do all he can, in creating a desire for agricultural information, or for imparting to others all the light which he can throw on it, as a science, we are particularly well pleased at any token of remembrance for ourselves or our journal, from that quarter. We know many *good* farmers in that section, and should like to hear from them frequently.

A New Work.

Letters on Modern Agriculture. By Baron Von Liebig. New York: pp. 225. 1859. John Wiley, Publisher.

Through Mr. James Woodhouse, of this city, we have received from the publisher a copy of the above new addition to our agricultural literature. It would be supererogatory in us to offer our commendation of a work of this distinguished author. His name and fame are as familiar as household words to American farmers and to the general reader, who will seek with avidity after any emanation from his pen on scientific agriculture.

The object of the author in these letters seems to have been to rescue practical agriculture from mere empiricism, and place it under the control of true science; to develop the general laws which must regulate sound practice if the most successful and profitable results are to be attained; in other words, they are to serve "as a mirror in which the scientific principles already established, and certain erroneous doctrines prevailing in practice, are reflected side by side; and each individual must be left to draw his own conclusions, on comparing his own acts with the standard thus furnished."

The work is for sale by Mr. James Woodhouse.

Farmer and Planter, (Columbia, S. C.)

We return our thanks most sincerely to the Editor of "The Farmer and Planter," of Columbia, S. C., for his generous and complimentary notice of ourselves and our journal in his issue of last month. The compliment we prize highly, since it comes from so worthy a source, while we earnestly wish that he may meet with the success to which he and his excellent paper are justy entitled.

We beg to assure him that our paper is *always mailed* to his address, and if it does not come to hand promptly, that we shall be happy to honor his drafts for back numbers.

A New Paper.

The Farmer and Gardner is a new paper, of which we have received the first number. It promises to be an accession to the list of valuable agricultural papers, of which we have many of high character. The reader will find an excellent article on "bone dust," in our present issue, transferred from the pages of that paper.

Concord Grape.

A fine bunch of grapes, of the variety called "Concord," was brought to our office a few days ago by Mr. E. G. Eggeling, Florist and Nurseryman, near this city. The bunch was large, (weighing 14 ounces,)—the fruit above an average, being about as large as the Black Hamburg, in appearance very much like it, with a very thin skin, a perfect bag of juice, and of the most delicate flavor. It is among the most hardy varieties, enduring the winter of New Hampshire without injury, and is, therefore, worthy of the attention of cultivators in our variable climate. The specimen exhibited was grown by John J. Werth, Esq., and plants can be furnished by Mr. Eggeling to persons desiring them.

A "Dun" in Earnest.

We have before reminded our subscribers of the great benefits which they would confer on us, by the punctual remittance of the small sums which very many of them owe us. We have to pay our Printers for every month's work when done, and every paper we send out costs us, in cash, a considerable part of the price charged for subscription. We endeavor to discharge faithfully to our subscribers the duties we have assumed, and every man can understand the necessity for reciprocal fidelity on the part of all those who are bound by mutual obligations. We cannot leave our duties to run from house to house, saying to each man, "pay me that thou owest," and if we could, it would be a very disagreeable thing to say, when we meet with those whom we hope to be allowed to regard as friends. We can only, then, remind them that we are subjected to inconvenience and loss, not by any fault of our own, but by their negligence, and would urge our claims upon their own sense of justice and the generous courtesy which every Virginian is proud to claim as his birthright. Our accounts are sent out regularly, and we shall always be glad to have them promptly paid, and hold ourselves always ready to correct any mistakes which may be found on any of them so soon as we may be notified of the existence of error.

Catalogues, &c., Received.

Fruit and Ornamental Trees, Vines, &c., from Isaac Pullen, Hightstown, Mercer county, N. J.

Fruits and Ornamental Trees, of Hopewell Nursery, near Fredericksburg, by H. R. Robey.

Alleghany High School, Session of 1859 and '60, situated at the Blue Sulphur Springs.

Premium List of the State Agricultural Society of S. C., to be held at Columbia on the 8th, 9th, 10th, and 11th of November, 1859.

J. M. Thorburn & Co.'s "Bulbs and other Flowering Roots," with directions for their culture and management.

Information Wanted.

A subscriber desires to be informed through the medium of our columns, as to the best plan to be pursued in raising a "Chestnut Orchard." Will some of our readers oblige him and us by giving the instructions necessary. We are under the impression that some of our Caroline county friends have paid some attention to this subject, and we shall be glad to hear from them.

Important to Milkmen.

We can see no reason why milkmen everywhere will persist in the habit of shipping such large quantities of water to our large cities, when water is so abundant and at such cheap rates. Why not evaporate the water and send the milk to the cities in nice cakes, which can be dissolved to suit the user's' taste and fancy.

Solidified milk is now manufactured purely and successfully in Duchess County, N. Y.; and for the benefit of the milkmen who are so largely engaged in the transportation of water, we will give here a description of the process of solidification.

The works consist of a large brick building, situated in a beautiful valley, seven miles from the nearest railroad station, in the centre of a milk-producing district. The basement is occupied by a large boiler and steam-engine; on the first floor are the evaporating pans; in the second story are the ventilators, drying, packing, and store-rooms. The milk is collected from the farm houses around twice a day, as soon as practicable after milking, and kept in a cool cellar under the factory. At first the milk is warmed by steam, in a large tin cylinder, up to 170° F., and a quantity of white sugar dissolved in it. Second, the milk is placed in large shallow pans, two inches deep; these pans are all kept at the temperature of 170° by means of a water bath under them. The pans are covered with a wooden structure, through which a current of air is drawn by the ventilators above. The vapor is thus carried away as soon as formed, and does not oppose evaporation. To prevent any portion of the milk from becoming solid too soon, and adhering to the pan, the whole mass is constantly stirred by steam power. After about five hours, the milk has become a sticky paste; the mechanical stirrer is removed, and its place supplied by a girl with a knife in one hand and a roller in the other, who prevents any portion of the paste from adhering to the pan, crushing the lumps to powder. After an hour of this work, the mass has become a dry mellow, white powder. All that remains to be done, is to keep it for a few hours in the drying room, and to pack it in tin boxes with a lid cover.

The composition of cow's milk is, for 100 parts of milk: water 87; butter, 3; cheese, 4½; sugar of milk, 5; salts, ½. The quantity of sugar added to the milk is 10 parts for 100 of milk, consequently one pound of solidified milk will make five of cow's milk already sugared; and make ten or more of such milk as is sold in the streets of this metropolis. But it is not necessary to dilute it in so much water, and those who can afford the luxury put the dry powder in their coffee.

Solidified milk keeps for months, simply by taking care not to leave it in unusually damp places. It has been carried to the Pole by Dr. Kane, and to the Equator on many vessels. It is used in the sick room in its solid form, when much nutriment is wanted in a small bulk, and it is congenial to the stomach.—*Scientifie American.*

Milk which does not yield Butter, and the means to Remedy it.

The author calls the attention of those who are chiefly interested in such cases, in which there is no disease of the mammary gland nor loss of milk, but a want of oleaginous matters in the fluid. In the causes of this deficiency of butter making quality, he concludes that there are *two* principal ones, viz: idiosyncrasy and alimentation; but there is another which cannot be so easily defined, and which occurs in animals that are well kept, and whose milk has been previously rich in butter. It is to these that the remedy is principally directed. The remedy consists in giving the animal two ounces of the sulphuret of antimony, with three ounces of coriander seeds, powdered and well mixed. This is to be given as a soft bolus, and followed by a draught composed of half a pint of vinegar, a pint of water, and a handful of common salt, for three successive mornings, on an empty stomach.

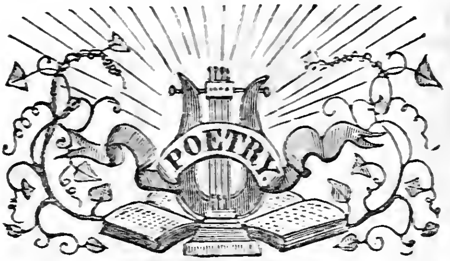
The remedy, according to the author, rarely fails, and the milk produced some days after its exhibition, is found to be richer in cream. The first churning yields a larger quantity of butter, but the second and the third are still more satisfactory in their results.

A letter from a farmer states that he had fourteen cows in full milk, from which he obtained very little butter, and that of a bad quality. Guided by the statements of M. Deneubourg, which had appeared in the *Annales Veterinaries*, he had separately tested the milk of his cows, and found that the bad quality of it was owing to one cow only, and that the milk of the others yielded good and abundant butter. It was, therefore, clearly established that the loss he had so long sustained was to be attributed to this cow only. He at once administered the remedy recommended by M. Deneubourg, which effected a cure.

Veterinarian.

Dairies and Bone Manure.

An English paper, in commenting upon this subject, remarks that the Cheshire dairy farmer, by the free use of bone manure laid on his grass lands, makes his farm, which at one time, before the application of bone manure, fed only twenty head of cows, now feed forty! In Cheshire, two-thirds or more, generally three-fourths of a dairy farm are kept in perfect pasture, the remainder in tillage. Its dairy farmers are commonly bound to lay the whole of their manure, not on the arable but on the grass land, purchasing what may be necessary for the arable. The chief improvement, besides drainage, consists in the application of bone manure. In the milk of each cow, in its urine, in its manure, in the bones of each calf reared and sold off, a farm parts with as much earthy phosphates of lime as is contained in half a hundred weight of bone dust. Hence the advantage found in returning this mineral manure by boning grass lands. The quantity of bones now given in Cheshire to an imperial acre of grass land is about twelve or fifteen cwt. This dressing on pasture lands will last seven or eight years; and on mowed land about half that period. But the grass land once boned and kept under pasture is never so exhausted as to be as poor as it was before the application.—*Rural New-Yorker.*



Watch, Mother.

Mother! watch the little feet
  Climbing o'er the garden wall.
Bounding through the busy street,
  Ranging cellar, shed, and hall.
Never count the moments lost,
Never mind the time it costs;
Little feet will go astray;
Guide them, mother, while you may.

Mother! watch the little hand
  Picking berries by the way.
Making houses in the sand,
  Tossing up the fragrant hay.
Never dare the question ask,
"Why to me this weary task?"
These same little hands may prove
Messengers of light and love.

Mother! watch the little tongue
  Prating eloquent and wild.
What is said, and what is sung,
  By the happy, joyous child.
Catch the word while yet unspoken:
Stop the vow before 'tis broken:
This same tongue may yet proclaim
Blessings in a Saviour's name.

Mother! watch the little heart
  Beating soft and warm for you:
Wholesome lessons now impart:
  Keep, oh, keep that young heart true.
Extirpating every weed,
Sowing good and precious seed:
Harvest rich you then may see,
Ripening for eternity.

The Sun-Flower.

What love is borne unto the sun
  By this expansive flower!
It turns its aspect to the skies,
  Whether they shine or lower.

And, as the luminary speeds
  His progress through the day,
This heliotrope inclines its head
  To greet him on his way.

And, when the sun withdraws his light,
  And seeks his ocean-bed,
The plant contracts his flowers, and droops
  As though his life had fled.

And, when the sun has ceased to sleep
  Beyond the Western main,
And peeps above the earth, the plant
  Erects its head again.

Whene'er the Sun of Righteousness
  Shines on me from above,
Mine eyes are lifted, and my heart
  Is lighted up with love.

Sometimes a vapor shrouds the sun,
  And grief and sickness brings:
I wait—the radiance re-appears,
  With healing on its wings.

When earthly objects tempt my heart
  Midst grovelling scenes to stray,
This plant will teach me to look up,
  And choose the brighter way.

Whatever love thou may'st profess,
  My friend, for other flowers,
Be sure to let this helitrope
  Be planted in thy bowers.

The fragrance of the blushing rose
  From cares may set thee free,
And the shy lily of the vale
  May preach humility;

But the sun-flower will teach thy soul
  Where Christians should aspire;
It points above, whence thou may'st draw
  A spark of heavenly fire.

* * * * * * *

SKURRAY.

She Always Made Home Happy.

She always made home happy,
  With her kind and winning ways,
With her voice of cheerful gladness—
  With her cheerful hymn of praise.

She always made home happy,
  Though she charmed no passer by,
With the beauty of her person,
  Or the brightness of her eye.

Though no pearls or rubies glittered,
  'Mid the ringlets of her hair,
In her heart there shone a radiance,
  Of a Jewel far more rare.

She always made home happy!
  Though her song was not divine,
Though no harp beneath her fingers,
  Thrilled to notes almost sublime.

Though no artist, yet she painted,
  Many a beam of heavenly love,
On the friendly faces round her,
  That shall shine in realms above.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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For the Southern Planter.

Tobacco the Bane of Virginia Husbandry.

No. 5.

Arator, the distingushed leader among the writers upon the subject of Virginia Agriculture, devoted a chapter to the politics of agriculture. It seems equally appropriate to introduce here, whatever can be justly said in relation to the morals of our agriculture.

It may be affirmed of our day and generation, that although wickedness is rampant and boldly makes fearful headway in the world, Christian morality is making comparatively greater progress:—and, that public opinion is conforming itself to the general movement, and wide spread agitation of all the elements of society,—to a higher and higher standard of Christian moral rectitude.

While there has always been an influential class who have contended that mankind has ever been the same in every age, and therefore are destined to go on unchanged to the end,—thus nullifying the consolatory promises of Holy Writ, for the conversion of the world; there has also been an unbroken band of believers, who have protested against this doctrine of the philosophers of the day, and who, in obedience to the commandment of their acknowledged Lord and master, have continued to pray "Thy kingdom come." This band has been of late greatly cheered by the signs of the times—they are honest and ardent searchers after truth, and will follow it, even to conclusions against themselves;—and to make confession of their errors before God and man is part of their sacred doctrine. They have long been known and designated as "the salt of the earth," the true conservative element of civil society, and form the only solid ground of hope for the amelioration of the condition of man. This band of believers, whose recent growth* forms a prominent sign of the times, is the only class likely to give attention to the moral aspect of this subject: they, therefore, may consider themselves as exclusively addressed; because among Christians only can be found the moral courage necessary to accomplish a moral reformation of magnitude and permanency.

Of all the vices which have hitherto gotten the upper hand of our fallen race, it may be assumed without the fear of successful contradiction, that the vice of tobacco-using, now outranks all others in the magnitude and variety of its injurious effects.

* Witness the thousands lately converted by the instrumentality of Christian Union prayer meetings, throughout the Christian world.

Strong drink, until of late, stood pre-eminently the master vice of the day, but, now, must yield the palm—since by the glorious dispensations of Divine Providence, the greatest moral reform of the age, has in a few years wrought the astonishing wonder of converting what was lately esteemed the token of hospitality and testimony of good fellowship, into an acknowledged shame.

Who that feels a decent respect for the opinions of the most respectable portion of society, now makes the offer of an intoxicating beverage a part of the first salutation of every visitor to his house? This custom, which universally prevailed of late, has now been driven out of the best society.

It must be admitted the serpent-demon is "scotched, not killed," but is still received and cherished in upper-tendom,* and the low sinks of vulgarism,—the two extremes of society, which have always been the most inaccessible to the graces of Christian life,—and it is sufficient for our purpose, to leave them as the chief patrons of a vice, which, in the progress of our age, has been proscribed, and in part driven out of the commonwealth of Christian morality; nothing doubting that they too must succumb to the greatest reformation which has yet been inaugurated in the 19th century, and is still making glorious progress.

But it must be allowed that this signal victory over the almost superhuman power of common custom, sanctioned, as it was, under the revered garb of the virtue of hospitality, has not sufficed to stop the growth of other evils: but seems rather to have encouraged a new vice, grown rampant in the land, and of equal capacity for evil with its declining predecessor, with some adaptations to mischievous results peculiarly its own.

Strong drink and tobacco have been aptly characterized as "Twin-demons." Nobody at all acquainted with this pair, will hesitate to allow them the most intimate relationship at least: for they both inebriate,—both produce delirium tremens, and by the testimony of the ablest physicians, and most authentic statistics, both contribute a large quota of subjects to our insane hospitals, and run up the record of premature deaths. Here, then, are four undeniable affinities between the "twin demons" in their leading traits. We shall, therefore, assume, throughout the rest of this essay, that strong drink and tobacco are, to all intents and purposes, kindred culprits, and stand equally liable to arraignment before the tribunal of progressive public opinion.

But leaving here the lately most prominent of the demons, to the instrumentalities by which the great leader of all true moral reforms,—Divine Providence,—has beleagured him in his strong holds, we must turn our attention to the more recent aspirant, who has already attained an equal empire in the earth, and possesses some pecularities more favorable to holding dominion over his conquered subjects, by influences hitherto but little investigated, and now acting upon all races of the Earth to a degree which amounts to nothing short of positive fascination. Let a short history of Tobacco testify to the foregoing allegation.

A noisome, poisonous weed—first found among the savages of a country recently discovered,—in comparison with the age of the world—so revolting to the instincts of a man as to nauseate to deadly sickness every one at its first use, and requiring more or less painful repetition to reconcile outraged nature to it; which finally, by perseverance becomes first tolerable, then by the force of habit agreeable, and lastly, an overmastering, indispensable *want*:—which being indulged, becomes so rivetted upon its votaries as to defy their efforts to shake off their fetters, after finding themselves, by their own acknowledgement, cruelly enslaved. Yet, wonder of wonders! they are held, spell-bound, by its fascination, and are reduced to the degrading humiliation of owning themselves powerless to resist their self-imposed task-master—though well known to increase his exactions to the bitter end of delirium tremens, and fell insanity, and premature death, after promptly doing its first work of marring the image of God in his creature man. As witness the discolored teeth and skin, the tainted breath, the extorted stream of tobacconized saliva, filling the once rude spitting box, now being supplanted by the more elegant adjunct in the Idol's temple—porcelain spittoons. This symbol of the Idol claiming an equal place with, and not unfrequently crowding out of the household, the stand and the Bible of the Christian family altar, as if to proclaim by this unmistakable ensign, the inauguration amongst us of this new god of a new

* This new term is now too well understood to need an explanation.

Idolatry. Yes, verily! Tobacco has become an Idol God amongst us, of far more extensive, varied, and baleful influence, than any other of the many Idols of Christendom. For that which occupies the greater part of our time and attention, and which cannot be classed among the duties enjoined by God, but interferes with those He has enjoined, and cannot therefore be the subject of our prayers, is an Idol to all intents and purposes.

All our legitimate duties, to ourselves, to our families, and to society, are enjoined upon us by Divine authority, and are to be performed with diligence: vide Rom. 12, 11, "Not slothful in business, fervent in spirit, serving the Lord;" but even these duties must not be suffered to encroach upon such portion of our time and services as the Almighty claims to himself. Tobacco claims all the time of its votaries, and places its followers in awful conflict with ths Divine announcement: "Ye cannot serve God and mammon." Ye cannot "serve two masters." Math. 6, 24.

It is undeniable that Idols abound in Christendom. All the world acknowledges money is an Idol, found everywhere with innumerable worshippers—from the miser, the high priest of this order, through an infinite number of grades down to the proverbial "Jew." Fame is an Idol also, whose votaries may be counted by thousands—claiming for man-worship the right of prescription. Under this head may be ranged the whole class of politicians, who, with a few exceptions, give their time and talents to the Idol God. Add to these the myriads of devotees to frivolous Fashion, the first class of whose disciples do little else but make every act of life a sacrifice at her shrine.

These are all Idolaters, as justly offensive to the Immaculate God, as the Idolaters of Heathendom who worship stocks and stones. In the light of Gospel truth, our Idolaters of Money, Fame or Fashion, can claim no distinction, but the distinction of pre-eminent wickedness (by the neglect of better opportunities) over the Idolaters of Heathendom: but all these fall short in point of enormity of the Idolaters of Tobacco, as will be made apparent in the sequel. Idol worshippers defend their respective Idols by what they consider appropriate pleas. Money Idolators claim that they promote business and trade, while they only take for themselves their usurious extortions. The devotees of Fame identify themselves with the glory of the country, and glorify themselves under the banner inscribed by themselves, "Public Good:" while the class of Fashionables, quiet their consciences with the plea of encouraging the milliners, merchants, tailors, jewellers and artists, sustained by the disbursement of their superfluous wealth; but the Tobacco Idolaters, while they have necessarily to resort to a greater variety of pleas, have none more available in reason or truth. For example, they plead that they encourage agriculture, by giving employment to the land and labour engaged in producing the increase for the Idol's temple, which has been already shown to be the bane of good husbandry wherever its cultivation has prevailed. Besides, it cannot be received as defence of a nuisance that it provides its own sustentation, especially by the prostitution of Agriculture, (a virtuous and legitimate calling,) to the production of a deleterious drug. Some have the hardihood to claim their use of Tobacco as an "innocent indulgence;" impiously diverting their time, their talents and their money, from the channels of God's service in the promotion of His honor and glory,—the Christian benevolent objects for which He demands them all.

Tobacco has every attribute which constitutes an Idol, and that it is an Idol of most mischievous and fatal character, the following facts demonstrate. It demands for its support an unnatural morbid appetite, which like all other morbid appetites, "grows by what it feeds on." It mars the image of God in his creature man, by discolouring his teeth and skin, tainting his breath, and by a species of salivation, diverting the saliva from its appropriate function, the promotion of digestion, to filling the receptacles of the Idol God, thus undermining the health, and finally overthrowing the constitution of the physical man. Nevertheless this demon fiend is sought after and embraced, although giving promptly these premonitory signs of the ultimate destruction that awaits his votaries, showing it is a fascinating Idol: thus we here have both Idolatry and fascination.

But the peculiar and most formidable feature of this evil is its influence upon the intellectual powers. It inebriates in the most subtile and insidious manner, invading the whole physical fabric, affecting the nerves and brain, and penetrating the very bones and marrow of the human system, (as has been proven by anatomical investigation,) and through that mysterious connexion of body and soul, reaches the moral and intellectual Being.

For the worship of other Idols, some degrading superstition, as in worshippers of Juggernaut; some sordid passion, as the miser's love of money: or the selfishness of the votaries of Fame, is required; but the Tobacco-Idol demands an unnatural, artificial, deforming bodily appetite, which through the properties of the poisonous aliment that feeds it, pervades the whole structure of the physical man: as is proved by signs manifest, already detailed; but, not stopping here, invades through the media of the stomach, nerves and brain, the empire of the mind: soothing it into a peculiar state of inebriation—inebriation of a different sort from that produced by Alcohol, but not less fatal in the end. It does not madden its victim at once into acts of violence and insanity, but soothes him into a state of dreamy indolence, good for air-castle building, but ending in making him "good for nothing." Herein we see how the Tobacco Idol is the most formidable of the Idols extant in the world, for it leads its deluded votaries to conclude that the speculations of a fuddled brain are really better than sober meditations. And so far does this delusion prevail with many, that they declare they can study and excogitate nothing so well, as in the Idol's temple, with his appropriate sacrifice in their mouths and noses, and his open receptacle at their feet, receiving the exacted tribute of their violated natures. Verily, there is nothing in the History of the Idolaters of the Earth, which looks more like fascination than this smoking, snuffing, chewing and spitting Idolatry, which first poisons the body, then deludes the mind, and finally makes of its victim, a hopeless driveling slave, to an unrelenting master.

But there are other counts in the indictment against Tobacco. It is the most fascinating of all the Idols of man—extending to the perversion of his moral sense and reasoning powers, so much so, as to make men defend the absurdity, that the sin of idleness is an innocent indulgence, and the dreamy castle-building of an intoxicated brain is improved and profitable meditation. Even ministers of the Gospel are known to defend themselves in this vice, upon the plea of innocent indulgence." What fascination does it evince, to call such an appropriation of time and money, (as is required for the Idol's service,) an "innocent indulgence." If it be granted, as we hear it is claimed by some as an apology for this vice, that it is no obstruction, but a facility to thinking and intellectual labour, this would lead to the rather dangerous conclusion, that thinking can be better done in a state of inebriation than a state of sobriety—to say nothing about the money for cigars, &c., necessary to furnish out the Tobacco—"feast of reason and flow of soul." The results of such thinking could hardly be conceived quite an acceptable offering to the throne of grace. It would be difficult to conceive a stronger caricature of christian devotion, or a more daring mockery of God, than the picture of a human being upon his knees, and in the attitude of prayer, with a lighted cigar in his mouth, and altogether of a piece with Pope Pious IX. taking his snuff while performing high mass. See About's Roman Question, pa. Need we farther proof that the influence of this Idol amounts to fascination, when we see the powers of the human understanding so perverted as to make men,—sober-minded and discreet upon all other subjects,—resort to flimsy reasons and wildest theories to defend their devotedness to their Idol God.

A Reverend and sage professor is known amongst us, who argues that Tobacco is as clearly a necessary of life, to sustain and minister to the nervous system, as meat and bread to sustain the other portions of the body.

It is known to be a settled opinion with the medical faculty that nervous diseases have greatly multiplied, since the inauguration of the Tobacco era, and to be alarmingly increased with the increased use of Tobacco in every community.

Another of the peculiar effects of this arch Idol, is its thorough pervasion of the tissues of the body penetrating even the bones and marrow. No wonder then where this subtle poison has been long, habitually used by both sexes, the children are born with the appetite—smoke in infancy, and thus sensibly dwarf the race, as is notoriously the case with the West Indian and Mexican nations. Witness, the well established opinion, that one Anglo-Saxon in our late war with Mexico was equal to two Mexicans. And yet as a farther proof of the character of the Arch Fascinator, our Anglo-Saxons have returned more excessive users of Tobacco than before the Mexican war.

Again, the Tobacco Idol demands constantly increasing devotions from his worshippers, until they can neither live, nor move, nor enjoy their being without the appropriate tribute in their mouths or noses. The natural aversion to the sickening drug, obliges all (except the thoroughly tobacconized Mexican and West Indian races who are now born with the appetite) to begin with the moderate use; but all experience shows a steadily increasing desire for it, until it becomes like the dram, with the habitual toper, the first thing thought of in the morning, and without the usual intermission of the drinking usage until midday occupies every hour until bed time, and then is often taken to bed with chewers and snuffers: but smokers have to rise and soothe their sleepless nerves, by ministering the incense to the unrelenting Idol God in the dead hours of night. Here we have an example of the colorable pretext for the fascinated professor's *nervine theory*.

Again, there is a palpable reason why this Idolatry occupies its votaries more entirely than any other, because it lays hold of the body as well as the mind, and levies a money tax upon its spell bound victims, and amuses by diversifying the worship paid to this Idol; for it has become mixed up with Agriculture, Manufactures and Commerce, and of late, is becoming, in the form of Spittoons, a part of the Furniture of our Churches.

It places the worship of this Idol temple in direct antagonism with the word of God, which says, "ye cannot serve two masters." The other Idolaters of Christendom profess to have intervals of time to devote to the worship of God, but this approprtates all the time, and thus virtually claims partnership in christian duties, and to have discovered, that two things may be done at the same time, better than one thing at a time; reversing the experience of the world, by the practical assertion of an absurdity.

But let us consider what are the advantages claimed by the votaries of this Idol, to countervail the legion of evils known to be in its train. The answers given to the oft repeated question: what good does Tobacco do? are so various and unsatisfactory as only to serve as farther proof of its fascination. Some claim that it is "the sovereignest thing on earth, for the preservation of the teeth," while many are known to have lost all their teeth who use it freely, and all find it fatal to their gums.* But some laud it highly for facilitating the process of thinking, and wonderfully aiding intellectual labor, which involves another absurdity; that mental operations can be better performed in a state of inebriation than in a state of sobriety; to say nothing of the money necessary to provide the material for the incense for the Idol's altar.

Can any influence leading men to such ridiculous absurdities, be anything short of fascination? Let then this wide-spread evil influence, be called by a more becoming and appropriate name; let it be stampt "the fascinating Idolatry," for nothing less can account for its inroads upon and its perversion of the reason and common sense of mankind. Herein is seen, the peculiarly mischievous effects of this Idol over all others; while the time, and attention, and money it demands brings its votaries in direct violation of God's claims to the undivided homage of his creatures, and holds them accountable for the gold and the silver which "are mine, saith the Lord." The inebriated state of the intellect, which is the inevitable effect of the drug, and the essential characteristic of the sacrifice for the Idol's altar, renders the insulting claim of a simultaneous service to God and Tobacco doubly wicked in view of the divine mandate, "ye cannot serve two masters."

But the great and master stroke of this Idol, (which but farther proves its fascinating power,) is to have kept the pious part of its votaries, so long in profound ignorance of their inveiglement. This wonderful delusion is effected in great part by not calling things by right names: the "soothing effect"-----the "innocent indulgence"-----the "pleasant excitement" in common parlance,

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* An able writer says, "the pernicious effects of Tobacco on the teeth are easily proved, although it has been pretended by some that Tobacco is a preservation of these useful organs----the delusion grows out of the fact, that Tobacco is found sometimes to have the effect of benumbing the nerve of the aching teeth. The first and most prominent effect of Tobacco upon the teeth is that it softens them----in some instances they become literally worn to the gums, and in others decay," but as often as either, drop out whole in a sound state from the destruction of the gums

must be baptized with the name of inebriation; for it is inebriation to all intents and purposes, as has been already shown by signs infallible and known to all men, and here in truth and reason may be called by the plainer and better understood name of "Tobacco-drunkenness." Tobacco users may be startled at first, and protest against the boldness of bringing their "pleasant excitement;" their "innocent indulgence," into the same category and under an odious name, which is denounced as sin, but they cannot deny, that although Tobacco inebriation does not drive men to the acts of sudden madness which alcoholic drunkenness does, that its results are equally disastrous, by a slow but not less sure process in producing in the end, dyspepsia, shattered and tremulous nerves, delirium tremens, insanity and premature death. JOHN H. COCKE.

To be continued.

THE TWO GREAT EVILS OF VIRGINIA AND THEIR ONE COMMON REMEDY.

(CONTINUED FROM OCTOBER NUMBER.)

So far as to criminals. But a more general and comprehensive policy should be adopted in regard to the whole class of free negroes. It should be required of all who are of capacity or ability to labor, that they should possess, either in property, or, from the returns of daily labor, the means of living honestly, and of supporting their families, if having any. To furnish this evidence would be no hardship, or grievance, to the honest, industrious, and provident laborers, or to others who had acquired some property by honest means. But for all who could not offer such evidence, it should be inferred, and assumed as proved, that they were living in idleness, and upon the property of others. The penalty should be the hiring out of every such free negro, to the highest bidder, for the term of one year, and for him or her to be on the legal condition of a slave for that time of compulsory service. Also, other notorious or proved offenders, as those habitually idle, improvident, or intemperate, even though still possessing some property—or gross abusers and maltreaters of their wives and children, should undergo the like temporary servitude and obligation to labor. The money obtained from such hirings, after paying, for the town or county, the necessary costs of the system, should next be used, or so much as was required for this purpose, to furnish necessary supplies of provisions, &c., for the dependent and destitute family of any of the offenders so hired out. Any surplus receipts from the hires, and also all net receipts from the sales of free negroes, should go to the state treasury. Regulations sufficiently stringent should be enacted to enforce the legal claim of the employer to the service and labor of a free negro thus hired, for the full term of the engagement. If he absconded within the time, and did not escape to a northern state, (as would occur in many cases,) the time of service so lost should be made up by longer extension of the term.

When the terms of servitude of such temporary slaves had been completed, they would be remitted to their previous condition of freedom. But for every one, male and female, who afterwards was convicted of any violation of criminal law—or otherwise resumed his or her former habits of idleness or vice, and failed to earn an honest livelihood, such second condemnation should subject the offender to banishment from the territory of the State—and if found therein, after 30 days, to be sold to the highest bidder, into perpetual slavery.

Legal officers, or commissioners, should be appointed in every county and town, to make the required inquisitions, and to carry the whole system into full effect. Every care should be used to select just and humane, as well as discreet and firm men for this duty. I admit that there would be great difficulty in having these important services well performed. But the general and more usual erring of the commissioners would be in using too much lenity, rather than causing the too severe execution of the law.

The worthy free negroes, such as are useful and also self-supporting members of the community, would suffer nothing from the most full and strict enforcement of this system. It would indeed be required of them to show that they had means for honest support, and the reputation of good conduct. That could be easily done—and when done, and known, the social position of all who had passed through that ordeal, and continued thereafter to maintain the same good character, would be greatly elevated. Now, a worthy free-negro is known as worthy, and respected accordingly, by his near neighbors only. To all other persons, and to strangers, he is merely a free negro—a term which always conveys the meaning of a general character of meanness, degradation and worthlessness. The line of distinction proposed to be drawn between the worthy and the unworthy, would serve as a certificate of merit, and an unquestionable claim to respect, which would be the greatest benefit that can be bestowed on any of this class. But this more elevated position would be retained only by continued good conduct, and would be enjoyed by the children of worthy parents only upon the same condition.

But there might be many free-negroes, either adults of good conduct, or children too young to be offenders, who would be incapable of self-support, and therefore would come under the operation of the measures proposed. Among such cases (as well as many of different character,) would be many women having young children dependent for support on the mother alone, and she incapable of supporting them. The system here proposed would generally also subject these to perpetual slavery—because their removal from the state would be either impossible, or would be rejected by the persons concerned, and old enough to choose. In most of such cases, the mothers would greatly prefer enslavement for herself and her children, whom she was unable to support, to exile. And their enslavement would not only be the most politic, but, in every aspect, the most humane procedure that could be adopted in such cases. In these, and all other cases of enslavement at the choice of a free negro, it should be effected under the existing general law—which authorizes such voluntary enslavement to a master chosen by the designed slave, and the purchase money to be one-half of the estimated value, and which is to be paid into the public treasury. All compulsory sales, (not of adults choosing enslavement, or the young children of mothers so choosing for them,) to be at public auction, and to the highest bidder.

If this system of policy were adopted, it would serve, within a year or two, to place in profitable service, as hirelings or as slaves, or would otherwise enforce the emigration of every known idle or dissolute adult free negro in Virginia. Every future violator of the criminal laws, of that class, would be enslaved—and most of these would thus be made productive laborers, and useful members of the community. The worthy members of the class, as before stated, would not only suffer no damage from the operation of the new policy, but would be benefitted by being thereby elevated in position and reputation. But good habits and morals are rare in that class, and still more rarely are they transmitted to children and succeeding generations. And when the children of worthy parents fell into vicious courses, they would meet the same fate with other unworthy members of the class. From this and other causes, even the best and selected portion of the whole class would decrease in numbers continually, until the time will come when very few, if any, free negroes will remain within the boundaries of Virginia.

From the commencement of the operation of this system of policy, there would be full warning, and ample time and opportunity, for any free negroes to leave the state, or, (if so preferring) voluntarily to enslave themselves, and choose their masters. It may be expected that, within a few months, great numbers will resort to one or the other of these different courses—and every case of either will be a relief or a gain to the community. Three years operation of the system will serve to remove, or otherwise to enslave, by choice or coercion, three-fourths of all the present number of free negroes, supposed to be 60,000. After that, any remaining evils of this kind will be reduced more and more, with every succeeding generation, until they will entirely disappear. Every person who deems negro slavery a benefit to Virginia, and free negroes an evil, can appreciate the importance and value of the change. It will be a great gain, even in pecuniary value, to get rid, by their banishment, or their fleeing to the north, of a portion of the present free negroes, which (for obvious reasons,) would include all the worst of the class. It will be another great gain to the public weal, to have the much larger portion of all who remained, converted to slaves, and made either present or prospective useful laborers. This change would be profitable to both private and public interests, even if the new owners bought the new slaves at full price and value, and paid for them to some other interest than the state. But much more will be the profits and benefits, when but half-price will be paid in most cases, and the whole purchase-money contributed to the treasury of the commonwealth. Further—the intrinsic value of all of our present slaves will be much enhanced, by the greatest cause of moral injury to them, and of discontent with their condition, being removed or extinguished.

THE REMEDY FOR NORTHERN ANTI-SLAVERY ACTION, SO FAR AS OPERATING UPON NEGRO SLAVERY IN THE SOUTH.

So far I have considered the direct benefits only of the policy proposed, in removing the nuisance of a free negro population. But there would be incidental effects and consequences of that policy, necessarily operating upon and effectively controlling the hostile action of our brethren of the slave-stealing states, which would produce to the south security and benefit of far more importance than all the direct advantages of merely extinguishing the original cause of annoyance. The voluntary emigrants, to avoid the expected future stringency of this new policy, and also the later fugitives from the bondage then newly established, would all flee to the northern states—most of which, and all of those near our borders, and on the Atlantic coast, have invited and endeavored to seduce our slaves to flee to them for escape and refuge. The northern states, either by legislation or popular action, have completely annulled the portions of the federal constitution, and law, which guarantied the restoration to their owners, of fugitive slaves. The states of Ohio, Pennsylvania, New York, New Jersey, and New England, all have been willing to submit to the injury of receiving this addition to their previous vicious free-negro population, for the gratification of thus assailing, and endangering the existence of slavery in the southern states. These illegal, and malignant acts, as well as many others still more iniquitous, were perpetrated but as means for the great end desired, of destroying the institution of negro slavery in the southern states. If this end could be attained, one consequence would be to leave in the southern states all their present slaves in the new condition of worthless free negroes. It has been throughout maintained by the northern anti-slavery fanatics, that this change would be beneficial to the south—and to sustain their argument and palpably false assumption, and to preserve the appearance of sincerity, they have been compelled to tolerate the continued influx of negroes (free and fugitive slaves,) into the northern states. Well! Should the new policy proposed be put in operation by Virginia, and the new classes of free negroes and fugitive slaves shall, in consequence, be hastening in thousands to the north, these states, if consistent with their past declarations, must still continue to receive, and to afford refuge and homes for, all these numerous immigrants—not only as heretofore declared useful additions to their population, but also on the score of what they have asserted as being the claims of humanity. If so consenting to receive the immigrants, these states will be thereby justly repaid in evil to themselves, for that which they have inflicted, and still more sought to inflict on us—which result, even in that aspect of retribution, is greatly to be desired. It would be well on our part to forward this movement, even by paying for the transportation of all emigrating free negroes to and across the Ohio river, or the Pennsylvania line—or, by ship loads, to be landed in New York and Massachusetts, or other states on the seaboard, also especially distinguished for active hostility and illegal assaults on the rights of southern slave-owners. Every free negro, or fugitive slave, landed in Boston, would, under the laws of Massachusetts, forthwith become a citizen of that state. It would be especially distasteful and repugnant to her to repel the entrance of persons who have been admitted and claimed to be American citizens in the fullest sense. Nevertheless, Massachusetts, and all the other northern states would be compelled to "eat their words," by passing laws to forbid the ingress of free negroes from the south, soon after we shall adopt the policy of expelling them from our territory, and thus operating to supply thousands of new black citizens to the northern states. But neither the laws nor the people of the north can possibly distinguish between the different kinds of negro immigrants—whether former or later slaves, or free—voluntary exiles, or fugitives from justice, or the prospective penalties of the new law. All, of course, for their better reception, would assume the character of fugitive slaves. Any prohibitory law of the northern states, to be effectual, would be obliged to exclude negroes of every description. And then, these prohibitory laws, necessarily made general in operation, and serving to shut out all fugitive and immigrant negroes, will be as strongly sustained by the popular feeling of the north, as that feeling has heretofore sustained the state laws, or policy, to invite the escape and flight of, and afford safe sanctuary to all fugitive slaves. Thus, the certain and inevitable result, of even Virginia alone adopting the policy of banishing free negroes, will be that every northern state will be compelled to legislate to exclude free negroes, (of which they will expect nearly the whole 60,000 to move northward,) and to do that, they cannot avoid the strict exclusion of every negro from the south, including all fugitive slaves. Our slaves will thus be effectually secured in our possession, by the zealous and earnest legal and police action of each and all of the northern states, heretofore earnestly engaged in stealing them. The guaranty thus afforded to us will be far more ample than the most stringent fugitive slave law that the Federal Government can enact—even if such law were as much and universally respected by the northern states, as the existing law has been denounced, opposed and trampled upon. Either Virginia or Maryland, each of which, more than any other state, has suffered by the slave-stealing of the north, even if acting alone in adopting this policy, may in this manner, completely demolish and extinguish the abolition action of the north upon the south, and turn the strenuous efforts of the north to preventing our slaves from entering their borders, instead of using, as now, every effort to invite them, and to aid their absconding, and protecting them from being recaptured. If this were the only end of the proposed policy in view, it would be better worth approval and adoption for that end alone, than for all the direct and very important benefits to be secured in the entire relief from the presence of free negroes. It is as certain as the result of any untried political measure can be, that the proposed policy and action of one state only, having as many free negroes as Virginia, can completely neutralize the fierce and incendiary abolition zeal, and quell the power for action of the northern states, and make them all our faithful and effective police force, and frontier watchmen, acting (though sorely against their will,) to keep our slaves from escaping, and to secure and strengthen the institution of negro slavery in the south. Pennsylvania, where a Maryland slave-owner was openly murdered, because legally pursuing his fugitive slave—(and his murderers were screened from punishment by the culpable inaction of the Governor as well as of other subordinate authorities of Pennsylvania, and the as culpable wrong action of the highest federal authorities)—and Ohio, still more infamous for systematic and frequent violations of our rights—near whose territory no Virginian can retain slaves, except at risks that take away half of their proper value—these two bordering states, would so diligently guard their most accessible territory from the expected entrance of our numerous free negroes, that no absconding slave could possibly enter, or escape in that direction, from Virginia. Property in slaves would be rendered more secure in the countries bordering on Pennsylvania and Ohio, than now in the interior, or on the upper tide waters of Virginia. And these border counties, now so deficient in labor; and suffering so much loss because of that depreciation, would soon have all of their now few slaves, by the security of their possession, raised to double their present intrinsic value—and safe-guards would be afforded for the landholders to obtain, by purchase, as many more slaves as are needed to cultivate these rich lands—which have long been of less than half their proper agricultural value, not (as alleged by anti-slavery reasoners, both abroad and at home,) because they used slave-labor, but because they could not hold it safely, and therefore could not employ half as many slaves as were needed.

The northern states, under the influence of their abolition leaders, who have so long had complete control in all matters connected with questions of slavery, could not immediately disavow their former professions, and reverse their established previous course of policy. Some year or two might be expected to elapse before any of the now slave-stealing states would be brought to submit to the new necessity, and to forbid the entrance of all negroes. During that time of doubt, or hesitation and delay, our free negroes, fugitives from the expected pressure of the new policy, would be crowding in thousands to the northern states. These early fugitives will include all the individuals of that class that it is most desirable to be rid of—the most daring, desperate, and vicious—and especially of the mulattoes, of intellect as nearly related to the white race as in blood. All the worst of the class will be thus conferred on the northern states, before they will have done anything to prevent the receiving of them. The longer that these states shall delay the enactment of preventive laws, the more will they suffer from the accession of this worst portion of the free negro population. And when they can no longer avoid the enactment of laws to exclude our negroes, their new policy will do more to defend and secure our property in slaves, than every thing that has been done to defend ourselves in this respect, since the advent of Exeter Hall philanthropy, and northern abolition fanaticism. It is true that this Exeter Hall and Boston fanaticism would be deprived of none of its malignity or its venom at home. It would there not the less loudly still continue to denounce negro slavery, and to curse and calumniate slave-holders. But beyond the borders of their own anti-slavery territory, their opinions would be powerless, because their hostile action, beyond, would be at an end.

It may be objected to this supposed effect on the north of the policy here proposed for Virginia, that Delaware (which is practically a free State) and Indiana have already prohibited the immigration of free negroes—and perhaps some others of the more remote western states—that Missouri and Arkansas have ordered the expulsion of their free negro inhabitants—and that no such effects have been produced as are here predicted for the latter policy if adopted by Virginia. There were but 3226 free negroes (in 1850) in both of the states that have expelled them—too few to produce any sensible effect upon the north. The fugitive slaves of a single year, from Maryland, Virginia and Kentucky, would amount to more than all the free negroes of these two states.* Delaware presents no inducement to fugitive slaves, or to free negroes, and can well be dispensed with as a place of settlement. Indiana is out of their usual route, and its excluding policy has therefore scarcely any practical effect on other states. But let Virginia act, as proposed, and it will at once be inferred by the northern states, (though very erroneously,) that all of her 60,000 free negroes may be expected to rush to Ohio and to the northern states, the usually preferred destination of all our fugitive slaves, and also of the heretofore few emigrating free negroes.

It may also be objected, on this head, that the system of measures and policy here proposed for Virginia, if adopted, would be mainly carried out, and completed, within a few years—and even if the northern states had previously been so constrained as to legislate to shut out the entrance of all of our emigrating or fugitive negroes, yet the pressure would be but temporary, and, with its cessation, the north would return to its previous policy of inviting and aiding the escape of slaves from the south. This might be so, if the action proposed were to end with Virginia. But, if the policy shall operate well here, it is certain that the example will be followed, either soon or late, and necessarily, by all of the other slave-holding states. Maryland and Kentucky may be some years later than Virginia, before concurring, and beginning to act. North Carolina and Tennessee will be still later. And the more southern states which feel less the pressure and evils of their less numerous free negro population, may be much slower in applying the complete remedy of removal. Altogether, it is scarcely to be expected that all the slave-holding states will follow this example before 15 or 20 years shall have passed. During all that time of partial and successive acts of banishment, by different states, the repression of the outside abolition action by the northern states will be compelled to continue. After that length of truce, if it shall again be necessary, the south can find other effectual means to defend its rights and its slaves.

OBJECTIONS TO THE GENERAL POLICY STATED AND ANSWERED.

I will now proceed to consider the most prominent objections to the policy proposed, which would probably be urged by a considerable number of citizens of Virginia, who deem the institution of negro slavery, as here established, to be rightful and expedi-

* Louisiana has also passed a law, which has but very recently (on Sept. 1st, 1859,) gone into operation, compelling the banishment of all immigrant free negroes, or such only as were not born in the State of Louisiana. All the individuals of this class, (not native born,) in 1850, amounted only to 2260, out of 17,462, the whole number of free negro population. This very partial and limited measure of expulsion, as in regard to all of the few free negroes of Missouri and Arkansas, can have had no important effect on northern interests or action.

ent, and beneficial to both masters and slaves, and to the whole community. It is not my intention to defend the policy against the conflicting opinions of either European or Northern negrophilists, of the Exeter Hall school of religion, morality, and political economy—or the very small minority among ourselves who may hold like opinions. The objections to be noticed are such as have been, or may be, urged by those who approve, and wish to maintain in security, the institution of negro slavery.

Objection 1st. If the banishment of the free negroes, from Virginia, was enacted, there would be no asylum left for them. Every foreign country would be forbidden to them, on account of the expense of removal, in addition to other great difficulties, of language, religion, and especially of want of means for support in a distant or strange land. All the slave-holding states are properly shut against them—one or more of the non-slave-holding states have enacted like laws excluding them—and all others will do the like, as soon as Virginia shall adopt this policy. Where then can the banished free negroes find refuge?

Answer. This, as a final consequence, has already been admitted as inevitable—and also claimed as the most valuable and important operation of the plan. But it will not and cannot occur so soon as has been supposed. Sufficient time and opportunity would be afforded for all to emigrate to the north, who desired it, and should very early resolve to do so. To all who postponed their departure for a year or two, there might be increased difficulties—and in a little more time, perhaps every northern state would be closed against the entrance of free negroes. All those who then remained in Virginia, would be such as had chosen to remain, and mostly in the condition of slavery. It has already been shown, and the question argued at sufficient length, that all these several occurrences—the early delay, and the final consummation of the northern laws of exclusion—the early emigration from our territory of one (the worst) portion of our free negroes, and the remaining and voluntary enslavement of another portion—will be different, but all highly beneficial incidents of the proposed policy.

Objection 2d. The removal of the free negroes would be both an economical and political loss to the commonwealth. Admitting the general indolent and vicious habits of this class, still their labor is of importance to the property-holders, and to general interests, in the localities where free negroes are most numerous. The removal of all, or a large proportion of these, would be a loss to agriculture. In the towns, the loss would be still greater. For there, the free negroes, bad as they are, serve best in many menial and low stations. If these were removed, their places could be supplied only from two sources, both of which substitutions are to be deprecated as injurious to public and private interests. One would be by increasing the already large employment of slaves hired from the country, (induced by the high rates of hire,) which service in towns, and as hirelings, operates soon to corrupt the morals and damage the worth of the slaves so hired, and also to abstract so much more labor from agriculture, for which it is already very deficient. The other source would be the employment of foreign laborers and servants, and new immigrants, which will constitute a still worse nuisance than even free negroes, and a new element of evil and danger to our interests in negro slavery. Further—the removal of the free negroes from the state would, to that extent, reduce the amount of the representative and political power of Virginia in the Federal Government and Union; and even if they remained as slaves, though the political loss would be less, it still would be considerable, in as much as five slaves would count in representation no more than three free negroes. Whether by banishment, or conversion to slaves, this loss upon 60,000 free negroes would be of important detriment to the political weight and interests of Virginia.

Answer. In the first place, all of the most industrious, useful, and worthy of this whole class would be left free as they now are, and even exalted in station and character, and thereby improved in condition. As to the incurably lazy, drunken, or vicious, even if all such were banished, their loss would be an economical gain to the country. To maintain the contrary, would be equivalent to supposing that the many thousands of petty thieves, beggars, and gypseys of England, are elements of wealth and strength, and that the country would lose by their banishment, or entire extinction. In regard to the less worthless, or partially industrious portion of free negroes, now acting as laborers, and to be removed by this policy, it is admitted that some inconvenience might be so produced at first. But no wide-spread and long-existing evil ever can be abated, without some early and grave inconveniences being felt. Precisely where the free negroes (in country places,) are most numerous, and therefore have been forced by necessity to resort more generally to useful labor, as hirelings, there will operate the strongest inducements for such individuals to enslave themselves under the proposed system, rather than break their social and also business relations (with employers,) and to incur new and untried risks and dangers in exile, to preserve their present very poor privilege of freedom. There can be scarcely a doubt that in such situations, the larger number will prefer to remain as slaves, rather than to leave the state. This would operate to lessen the supposed loss of hireling labor. Further, the new and complete security afforded to property in slaves, would cause many of those now sold abroad, to be retained, and others to be bought elsewhere, and removed to all the border counties of Virginia, where they are now without safeguard or protection—and thus, as well as by the increased general security and value of slave property, every anticipated loss in population, or of representative weight, in Virginia, will be speedily replaced and doubled in amount.

Of another part of the last stated objection, I admit the force. Free negroes, with all their defects, are useful in the towns as labourers and servants—or more so than their substitutes, whether hireling country slaves, or white foreigners. It would be expedient, in any event, to alter our present legal policy, (which confines free negroes to their native town or county, but which prohibition is rarely enforced,) so as to permit them freely to move to the towns, where they are most inclined to go, and to remain, and are most needed. If the new policy here proposed were adopted, the greatest possible influx of native free negroes to the towns could do no harm, as the worthless and vicious there, as elsewhere, would soon be banished or enslaved. Thus the towns would obtain a new and large supply of service and labor, which is greatly needed, from the better and more industrious of the class, and be relieved from the more worthless. Neither would a continued increase, or even the maintenance of the numbers of this population, by procreation, be expected. For reasons, which have been previously stated, and need not be repeated, the free negro population of considerable towns must be always decreasing, unless accessions are received from some outside source of new supplies.

Objection 3rd. The inhumanity of condemning the free negroes who are incapable of self-support, and especially women with their young children, to perpetual slavery.

Answer. In regard to the general question of enslaving any negro, previously free, the justification is found in the general and unquestionable expediency of the measure. The negro is only fitted, and doubtless was designed, to be directed and ruled as a slave—and his best and most humane control, and profitable service and use, is as the slave of a white master. Lunatics and idiots are subjected to strict control, because it is not less required for their own safety and benefit, than for the public good. All children, until reaching legal age as adults, are subject to the control of their parents, or, in other words, are strictly and fully the slaves of their parents. So also are indentured apprentices to their masters—and even woman to man, in a general sense—and more strictly and particularly, wives (however loved, cherished and indulged, still) are slaves to their husbands. If their wishes were consulted, all these subjected classes, except most of women and wives, would prefer to be free. Not only the insane and the foolish, but most children of 12 years of age, would prefer to be controlled only by their own discretion and inclinations. But the ruling authorities, possessing and exercising power, at no time have consulted any of these subjects of control, to obtain their consent. They have rightly and properly, as well as despotically, kept in slavery all these classes, amounting to three-fourths of the people of the civilized world. And so it is best for the negro race to be enslaved. More especially is it so for the destitute and helpless, who, if left entirely to themselves, would perish miserably before becoming capable of earning a support.

I have not designed to discuss the instituting of slavery as a question of natural law.* Without appealing to the general sanctions of natural law, I will meet the charge of injustice and inhumanity in the proposed enslavement of negroes incapable of self-support, in another mode of argument, and by the application of like facts to different cases.

Let us suppose that precisely such a case of want, destitution of means, and physical incapacity for enough exertion of labor to provide food and support, were to occur, as such cases do occur in thousands of instances, every year, in England, and in Massachusetts—of a widow or husbandless wife, with more young children than her means or labor can support. What would be, and what is the regular course of procedure in Puritanical New England, or in Pharisaical Old England—of which all the pious and philanthropic loudly offer their thanks to God, that they are untainted by the sin of negro slavery? I assert and maintain, that in all such cases, in both these countries, and under the general operation of their poor laws, all such helpless and destitute mothers, and their children, are consigned to pauper slavery—which certainly differs from negro slavery in several particulars, but in every one to the disadvantage of the former, as being more hard to bear, more cruel, and injurious to all parties, and also growing more extensive in operation, and worse and worse, with the progress of time. One of these differences is that these pauper slaves are in England wholly, and in Massachusetts principally, of the superior race. Another difference is that negro slavery, in its comforts, provision, and protection, as well as its required services, is perpetual on all the individual subjects and their posterity—and so much the better for the value of the service, and the well-being and contentment of the slaves. Pauper slavery is not the less continuing unto death, to the aged, or the incurably infirm. To all such, the bondage is literally perpetual, while the character of perpetuity does not, as in negro slavery, operate to increase kindness or comforts. Another difference, and a certainly occurring incident of every such case of pauper slavery, is, that the children are separated from their mother, and from each other, without compunction, and are put out to labor or service to whomsoever will relieve the parish of the whole, or even the smallest portion of the expense of support for each child. And these children are continued to be held by a succession of masters, as slaves in every respect, but that of having kind and interested care bestowed on them, until they reach 21 years of age. There will, indeed, then occur to each, a time of (so-called) freedom—but, in truth, of a different kind of slavery only, (that of labor to capital, or wages-slavery,) until the individual is again infirm, or incumbered with too large a family to be supported—when recommences the operation of pauper slavery. The greater number of English day-laborers, if they did not begin their lives in the poor-house, expect to close them there, in pauper slavery, severe privation, and misery. The cases, as yet, are fewer in New England—but the suffering and pressure of slavery, in each occurring case, is not less. For these pauper slaves, there can be no operative interest felt by their directors or employers, except that of obtaining from them as much labor as possible, at the least expense of maintenance. The changes and intermissions of this slavery only make its inflictions the more severely felt. The perpetuity of negro slavery makes it the interest of every owner to be careful of his slaves' health and comforts, and produces attachment and kind feelings of regard in both parties. If the young victims of pauper slavery are individually emancipated after a time, and probably only for a time, the system of this kind of slavery is not the less permanent, and increasing in oppression, on the whole class of the infirm and destitute, taken altogether. For every individual who is discharged and released from this grievous bondage, there is another new subject, or more than one, placed under it. Thus, however the individuals may be changed, the full number of pauper slaves is always kept up, and the measure of their suffering is never diminished, and cannot be diminished.

But, it may be further objected, that the mothers and young children, subjected to pauper slavery, were not reduced to a destitute condition by the direct action of the government, as would be the case of negro wives and mothers left destitute by the act

* This interesting question has been ably discussed in the Address of Professor J. P. Holcombe to the Virginia State Agricultural Society, (1858,) on "The Right of the State to institute Slavery," &c.

of government proposed, in banishing or enslaving the husband or father. This cause of the loss of support would not exist, nor the consequences, unless the husband or father had before supported his family by dishonest means. If he had been, not dishonest, but only idle, or drunken, and worthless, he was more likely to have been a burden on an industrious wife, than an aid to her support. But however the destitution of a family may have been brought about, there can be but one of three means of treatment or remedy: 1st. to leave them to starve, or to be saved therefrom by begging, and the precarious aid of voluntary private benevolence; 2nd. to support them by the poor-law system; or 3rd., as proposed here for destitute negroes, to subject them to perpetual slavery—which last is, for the community, the best by far, and for themselves, the most merciful and beneficial course.

But in regard to England, the destitution of numerous mothers and their children, is produced directly and immediately by the acts of government, and that act inflicted illegally, unjustly, and most cruelly. In time of war, every married as well as other sailor is liable to be impressed to serve in the navy, without limit of time or place. This impressment is most generally made on the crews of merchant ships, as they reach their ports in England, and when the sailors were about to meet their families after a long absence. When thus torn away into naval slavery, in addition to every other infliction of mental and physical suffering from this blow, the wife and young children are deprived of their means for maintenance, previously supplied by the husband and father, and must become pauper slaves. How many thousands of such cases have been produced in slavery-hating England, can not be estimated. But the unquestionably very large numbers, and the extreme misery as well as injustice and cruelty of the cases—each one of which has caused more increase of suffering than would 100 cases of free negro enslavement—have had no effect in exciting to action either the philanthropy or the justice of England, to prevent these direct, numerous, and customary causes of slavery of the worst kinds, and the most productive of unhappiness to the victims.

My argument is ended. If the treatment of the subject has been more extended than was required for full and clear exposition and reasoning, I trust that the error may be pardoned on account of the novelty of some of the views presented, and the importance of all. The consideration and disposal of the subject is now submitted, and earnestly recommended, to the care, wisdom, and patriotism of our legislators, who have full authority and power to act in the case. Their choice, or their adoption or neglect of the proper policy and action, will have most important results, for weal or for wo, on the great interests of Virginia, and of all the other slave-holding states of this confederacy.

CALX.

September 17th, 1859.

For the Southern Planter.

Salt a Preventive of the Firing of Tobacco.

MR. EDITOR—As the firing of Tobacco, (as it is called,) is the greatest malady to which the crop is subject, so the discovery of a preventive of it would be of the greatest importance to Tobacco planters. Doctor Spragins, of our county, some twelve or eighteen months ago, wrote an article, published in your Journal, in which he attempted to show, both from reasoning and from facts, that salt was a preventive. As I know nothing of Chemistry, of his reasoning I could not judge. His facts, though, immediately struck my attention, for I had, for several years before his publication, used salt in a mixture of concentrated manures I had applied to my Tobacco crops; and they had escaped firing, except in one instance, and that in a very small degree. In this instance the crop sold at a very high price, showing it to be very little injured.

In support of his opinion I proceed to state facts which have occurred within my knowledge the present year, it being a year in which tobacco has fired very much in every section of the country I have heard from. As to my own crop, I used, as I have already observed, salt (ground allum) in the mixture of manures applied to it. The mixture was applied to the whole crop of 60 or 70 acres, except a piece of 7 or 8 acres, on which Peruvian Guano alone was used, and two beds of land lying side by side, on one of which was applied Peruvian Guano alone, and on the other American alone, to test their comparative value. Now, though the crop was on various soils, red and grey, high land and low grounds, it fired no where except on the piece of 7 or 8 acres, and on the two beds, the tobacco all around the two beds escaping.

These facts, in relation to my own crop, induced me to make inquiries of other neighbouring crops, and I have ascertained that wherever salt was used, they have not fired, except in one instance, and that in a very small degree on a small part of the crop, and that generally where it has not been used they have fired. I could mention several instances where one crop has escaped, and an adjoining one has fired, as it had been applied or not.

Salt then, it would seem, is a preventive of the disease in Tobacco called firing, and I should certainly so conclude did I not know that it requires a number and a series of experiments to confirm a theory. The facts I have stated, coupled with those stated by Doctor Spragins some time ago, I think are sufficient to induce planters, who have not used it heretofore, to try it hereafter, and therefore they are communicated.

W. M. WATKINS.

October 6th, 1859.

From the Mark Lane Express.

English Feeding.

If the Englishman of the present day is better fed than his ancestors, or than the native of any other country, the same improvement is also extended to his domestic stock; for the wisdom and economy of good nutritious food for laying on fat and flesh are now thoroughly understood. Our cattle and horse kind are not left as in some countries, to collect a scanty provender from rank grasses in steppes, savannahs, or prairies; to munch upon the sprouts or twigs of trees, or to luxuriate upon rank sea-weed or fish upon the sea-coast. The best pastures of natural and artificial grasses are prepared for their special behoof, hay is laid up for their winter store, green crops and pulse are cultivated to a large extent, and the choicest oleaginous food, meals, and various delicacies to gladden their palates, are imported to a large extent, while the best of shelter is also provided for them. We boil and steam their vegetables and roots, and treat them as kindly as our own children. Chemistry is continually brought to bear upon the analysis of the substances to be tried as cattle-food, and those only selected for general adoption which are found to be most nutritious and fattening; while various experimentalists strive, from time to time, to make food-compounds for extensive use, which shall combine fattening qualities with portability. As no other country pays so much attention to the improvement of breeding and fattening cattle for the market, so no country has experimented more on the nature and property of cattle-food. Every useful substance is pressed into requisition, from the chaff or straw of the barn to the more expensive meals or prepared food.

When we look at the numbers and value of our cattle and sheep, the importance of making a due provision for their sustenance becomes evident. It is for this purpose chiefly that the large quantity of 17,000,000 to 20,000,000 tons of turnips and mangel-wurzel are annually grown in the kingdom for feeding our cattle and sheep in the winter. In Ireland 5,000,000 tons are annually grown; in Scotland 6,500,000 tons; and in England fully as much must be grown, although we have no specific returns. When we consider that a beast will eat a hundred weight, and a sheep a quarter of a hundred weight per day, a due provision of this esculent root is certainly very necessary.

But a number of other miscellaneous substances are pressed into service from cheapness, or as being readily at hand. Brewer's grains and malt commings are readily purchased by some for feeding. Rye-meal, barley-meal, sago flour, Indian corn-meal, rice-meal, anything which can be obtained cheaply and in quantity, comes in useful for fattening calves, &c. Our American brethren have been growing tomatoes to feed their milch cows on; but we should suppose the crop would scarcely be a remunerative one, or indeed in any way so beneficial as our ordinary kinds of food. The sorgho stems would be far preferable, from their saccharine and fattening properties.

But as an element in the meat-manufacture, whether in the building up and development of the young and growing animal, the maintaining of the produce of the dairy-cow, or the final preparation of the animal for the butcher, linseed is of the highest importance to the agriculturist. Linseed cakes have been shown by experiment to be far superior to Indian-corn, pulse, or any description of food, for the production of fat. English oil-cakes are of course preferable, from being fresher, and containing more oil; but the consumption of foreign oil cake, as we have shown on former occasions, is largely extending, and bids fair still further to increase—our imports now are about 100,000 tons, nearly half coming from the United States, and consisting chiefly of cotton-seed cake. Although all the cake imported is not applied to feeding purposes, some of the rape-cake being used for manure, still the bulk is for stock.

In Ohio and the other leading American States, a large quantity of Indian-corn stalks are used for fodder, and the cob is ground up for feeding; while in the West Indies the expressed stalks of the sugar-cane, and the tops which have been cut off, are highly relished by cattle.

An article of cattle-food that has come largely into use of late years is the legume, known as "locust" beans, being the food of the carob tree (*Ceratonia seliqua*), of which considerable quantities are now imported as cattle-food. They are grown and consumed to a large extent in Spain, Portugal, Crete, and the greater part of Southern Europe. In Sicily the amount gathered reaches 11,000 or 12,000 tons a year. They have long been used as food for cattle in Spain, and other quarters, and are even relished by the inhabitants, when fresh and ripe, from the sweet pulp they contain. About 3,000 tons are grown in Portugal, and 2,000 tons are shipped annually from Crete. The mean of three analyses gives 65 per cent. of sugar and gum, and about 25 per cent of nutritious vegetable matter. They are imported largely at Taganrog, and there is no doubt that their value as a feeding substance being appreciated, a very greatly increased supply could be obtained from several quarters in the Mediterranean.

How much of the science of farming and of all other arts depends upon the saving of material! upon imitating that beautiful law which chemistry teaches us, that in nature nothing is lost! This was well demonstrated by Mr. Simmons in his recent lecture on the utilization of waste substances. We may add another instance pertinent to the subject under notice. In Edinburgh there is a distillery of great extent, where economy of heat and material is especially carried out. The "dreg," a waste product, was produced in such quantities that all the cows in Edinburgh could not consume it, and there remained an enormous surplus which had to be discharged into the water of Leith. This nuisance the modern Athenians protested against as an outrage on their sweet-smelling city. Something had to be done. Seed-cake had been used by farmers, and it occurred to the proprietors that the "dreg," as well as oil refuse, might be pressed into a cake. Machinery was accordingly fitted up, dreg cake was prepared, and now the proprietors realize £60 a week from the waste product, which, although so much despised in Edinburgh, is now sent to the farmers in all parts of Scotland, to be returned in the form of fat cattle and butter and cheese.

A French veterinary surgeon, of the Imperial Guard, has called the attention of the agricultural world to a biscuit-fodder for cattle in times of scarcity occasioned by drought. It is composed of the usual provender—hay, grain and pulse. To these may be added many others—such as the refuse of the wine-press, the pulp of various roots, the stalks of millet and maize, the leaves of the vine, the beet-root and of certain trees, and the sweepings of the barn and hay-loft, which contain a vast quantity of nutricious matter in the flowers and seeds of hay, which are generally thrown away. All these ingredients are bruised and chopped together; a mucilage of barley-flour is added, with a little salt; and the mixture is then left to itself for a few hours until a slight fermentation has set in, when it is put into square moulds, made into cakes, and left to dry in a current of warm air.

Gold and Silver.

The immense specie movement of the present year attracts increasing attention. The imports and exports of these metals in France, Great Britain and the United States for the first six months of the present year were as follows:

	U. States.	France	Gt. Britain.
Imports	$3,101,000	$119,548,101	$96,596,773
Exports	36,901,702	77,440,101	94,763,475
Excess imports		$42,108,000	$1,833,298

The United States, from Boston and New York, shipped nearly $37,000,000 in the first six months of the present year. That, however, which was shipped in the last half of July did not appear in the English returns for the first six months, since it had not arrived. The general result shows that in the aggregate France and England absorb the metals largely, while the United States are undergoing rapid depletion. The exports in the last two months have been over $20,000,000. The English returns gives $20,779,926 received from the United States in the first six months of the present year, which leaves $16,901,702 as the amount sent hence to the Continent and elsewhere. If we divide the silver from the gold, we find the movement to have been as follows:

	Exports.	Imports.
	SILVER.	
France,	$51,691,201	$26,179,860
Great Britain,	48,718,556	39,821,018
	GOLD.	
France,	25,763,321	93,412,101
Great Britain,	46,044,919	56,775,755

Of the English imports of silver $19,809,162 was from France, which would leave $82,000,000 of silver exported by France and England in 6 months. Of that amount $42,748,371 went from England to Asia. The North of Europe and Central America furnished England with the balance of her import. Asia absorbs a quantity of silver apparently equal to the whole production of California and Australia in gold, while France in the last six months has absorbed $67,700,000 worth of gold—more than equal to the whole production of California and Australia. In the same six months the United States have lost $20,000,000 more than the California product. Taking the two metals together, France is increasing her currency at the rate of $72,000,000 a year. and the United States is losing at the rate of $50,000,000 per annum. This is a strange state of affairs. That the United States should lose the product of California is not remarkable, but that it should lose double that amount, while the premium on gold is 2 per cent. in Chicago and St. Louis, is remarkable.

Since the 1st Jan. 1856, France has lost $150,000,000 of silver, and gained $243,000,000 worth of gold! The United States are estimated to have $100,000,000 of coin, and at the present rate of export in two years they will not have a dollar! To what extent is the drain to go on?—*U. S. Economist.*

Worldly happiness is but a picture that is seen by the eye of sense in the false light of the present time, and therefore is imperfectly beheld.

Judge not the merits of a man by his great qualities, but by his use of them.

Draining Farm Lands.

The benefits resulting from the underdraining of farm lands has been a settled question for many years in those countries of the old world distinguished for science and skill in practical agriculture. It is also a settled question with some of our enterprising farmers, but with the mass of them it is a new subject, so far as their own practice is concerned. A healthful general interest is now felt in this matter by our agriculturists; and this, we think, must eventuate in good results.

Underdraining consists in cutting deep narrow trenches on lands, for the purpose of tapping undersprings near the surface, and also for carrying off rain water that would otherwise collect and stagnate near the roots of the plants. Some contend that underdrains should also embrace the feature of admitting air and ventilating the under surface of soils. This question should never be touched upon in this connection; the removal of the surplus and stagnant water is the main object of drainage. Underdrains are covered and placed at such a depth from the surface as not to interfere with the plowing or with other mechanical operations in the field.

There are differences of opinion among practical men as to proper depth, and the requisite distance apart at which drains should be laid. This arrangement must depend in a great measure on circumstances. Deep drains are far more expensive to cut than shallow ones, but then a smaller number are required in each field. At one period two-and-a-half feet drains were common in Britain, now five-feet drains are becoming more general. Four-feet drains situated forty feet apart will afford effectual drainage to any field, but the proper depth depends almost entirely upon the nature of the land. If the cutting is through hardpan, three-feet drains situated thirty-five feet apart will be the cheapest, and answer perhaps as well. They must be placed beyond the reach of frost as an imperative condition; when this is secured, they can be cut deep or shallow, according to the nature of the ground, so long as they are able to carry off the surplus and stagnant water.

The material of which the drains are made is an important feature. The oldest drains were formed by cutting to the proper depth, laying up the cuts with a layer of cobble or loose stones, then placing some brush-wood or straw over these, and filling up with the soil. These drains soon choke up with mud, and they have been mostly superseded by open drains, formed of unglazed tile or earthenware tubes, molded and burned like brick, and having joints or collars where the ends join. They are the most expensive drains at first, but the cheapest in the end. One kind of tile consists of a flat bottom, with a semi-tubular top. They are laid down in such a manner as to lie in perfect line, with a slope of about one foot in the one hundred feet; this fall is sufficient to carry off the water. Tubes of about one and a half inches in diameter answer for the lateral drains; these should lead into one general or main discharing drain of large diameter. Where flat stones are abundant, very good open drains may be made by laying them on edge to form the sides, then covering them on the top with flat caps. Loose stones, if they can be obtained, should be laid upon the top of covered drains before the soil is filled in.

Considerable engineering skill is required in laying out a field for proper drainage, so as to give all the drains the proper incline, and carry off the water by the natural slope of the land. As there are elevations and depressions in most fields, no *particular* directions can be given for laying out all the drains in them—they must be planned according to the circumstances of the case. There are few of our farmers who have not sufficient ingenuity to engineer their own fields and lay out their own drains, if they apply themselves to the work.

All stiff and springy soils should be drained, and especially those which have clay subsoils, as these retain the water and form undersprings which injure the roots of the plants. One great object of drains is to tap shallow springs, and another is to carry the rain water down through the soil, and prevent so much surface evaporation, as it carries off the heat, and reduces the temperature of the plants and ground. Sandy soils with gravely under strata do not require drains, as they afford good drainage from their very constitution.

A recent number of the *Mark Lane Express* (London) contains an article from its American correspondent—Mr. Henry S. Olcott, of this city—a scientific agriculturist and able writer on such subjects, which affords some very useful information on underdraining. He describes the case of Mr. John Johnstone, an intelligent farmer who resides near Geneva, N. Y., as an instance of great success in draining farm lands. He commenced operations about nineteen years ago, and has laid about forty-seven miles of drains upon his farm. During one season, when six of his neighbors raised only seven bushels of wheat to the acre, his fields yielded twenty-nine bushels. This case is cited as positive proof in favor of the profits which may result to every farmer who underdrains his lands thoroughly. We know that the great majority of our farmers have not a sufficient amount of capital to carry out such a system of improved agriculture, but we think that most of them can do something, however little, to introduce and commence the work of progress in this department of practical agriculture.—*Scientific American.*

From Hall's Journal of Health.

Coolings.

To make water almost ice cold, keep it in an earthen pitcher, unglazed, wrapped around with several folds of coarse linen, or cotton cloth, kept wet all the time. The evaporation from the cloth abstracts the heat from within, and leaves the water as cold as it ought to be drank in summer, consistent with safety and health.

Cooling rooms: the least troublesome plan is to hoist the windows and open the doors at daylight, and at eight or nine o'clock close them, especially the external windows and shutters, if there be any, except to admit barely necessary light.

Churches may be kept delightfully cool in the same way, and thus greatly add to the comfort of public worship, leaving the windows open, but the lattice shutters closed, on the north side of the house, which will secure a thorough ventilation.

Still greater coolness may be produced by having a large heavy cotton or linen sheet hung near each open window or door, and kept constantly wet; the evaporation produces a vacuum, and a continual draft of air is the result. In India and other eastern countries, common matting is used; long grass plaited answers a good purpose. In Germany, a broad vessel or pan is kept in the room, nearly filled with water—the pan, not the room—the surface of the water being covered with green leaves.

To have delightful hard butter in summer, without ice, the plan recommended by that excellent and useful publication, the *Scientific American*, a year ago, is a good one. Put a trivet on any open flat thing with legs, in a saucer; put on this trivet, the plate of butter, and fill the saucer with water; turn a common flower-pot upside down over the butter, so that its edge shall be within the saucer, and under the water. Plug the hole of the flower-pot with a cork, then drench the flower-pot with water, set it in a cool place until morning; or if done at breakfast, the butter will be very hard by supper time. How many of our city boarding-school girls, who have been learning philosophy, astronomy, syntax and prosody for years, can, of their ownselves, write us an explanation, within a month.

To keep the body cool in summer, it is best to eat no meat, or fish, at least not oftener than once a day, and that in the cool of the morning; making a breakfast dessert of berries of some kind. Dinner, light soup with bread; then vegetables, rice, samp, corn, cracked wheat; dinner dessert of fruits and berries, in their natural state, fresh, ripe and perfect. Touch nothing at all at supper, but a piece of cold bread and butter, and a single cup of some hot drink, or in place of these, a saucer of ripe berries, without sugar, milk, cream or anything else, not even a glass of water, or any other liquid, for an hour after.

To keep the head cool, especially of those who live by their wits, such as lawyers, doctors, editors, authors, and other gentlemen of industry, it is best to rise early enough to be dressed and ready for study, as soon as it is sufficiently light to use the eyes easily without artificial aid, having retired the evening before, early enough to have allowed full seven hours for sound sleep; then study for about two hours; next make a breakfast of a piece of cold bread and butter, an egg, and a cup of hot drink, nothing more; then resume study until ten, not to be renewed until next morning; allowing no interruption whatever, until the time for study ceases, except to have the breakfast brought in. The reason of this is, the brain is recuperated by sleep, hence its energies are greatest, freshest, purest, in all men, without exception, immediately after a night's sleep, and every moment of thought, diminishes the amount of brain power, as certainly as an open spiggot diminishes the amount of liquid within. Nature may be thwarted, and her plans wrested from her; and habit or stimulation may make it more agreeable to some to do their studying at night, but it is a perversion of the natural order of things, and such persons will be either prematurely disabled, or their writings will be contrary to the right and the true. As the brain is more vigorous in the morning, so is the body, and vigor of both must give vigor of thought and expression, that is, if the head has any thing inside.

From the Valley Farmer.

Agriculture—Its Importance.

BY C. N. BEMENT.

Agriculture is the body, whilst the other professions are members; and although the body and members are mutually dependent and reciprocally useful to each other, the body can exist without the members much better than the members can exist without the body. For the purpose of comparison, agriculture may be considered as a *trade*, an *art*, and a *science*. The *trade* is mechanical, requiring muscular strength. It is imitative—it is to do a thing as one has been taught to do it before. The ox, in a measure, acquires it. He knows his master and his master's crib. He treads the accustomed furrow, turns at the headlands, and obeys the driver's commands.

The *art* implies co-operation of the mind with physical power. The mind contrives; it is a lever which greatly assists and abridges the labor of the hands. The mind, like the soil, makes returns in proportion to the culture which is bestowed upon it. Both are unproductive without culture. The mind is improved by observation and reading, which makes it familiar with the best models of practice, and enables it to profit by the improvement of others.

The *science* teaches the laws and proportions of inorganic matter—as of rocks, earths, manures, &c., &c.; of organic matter, as animals and vegetables; of their structure, food and uses; and the agency of heat, water, air, light and electricity in their development and maturity; the employment and adaptation of these matters for the best uses of man. It contradicts the experience of ages and the labors of nations upon these interesting subjects, and makes them subservient to our wants and our comforts. The science is a collection of facts and leading truths, illustrated in practice and confirmed by experience.

Land and labor are the legitimate sources of public wealth. The first, to be productive, must be cultivated; and the labor of doing this is abridged by the culture of the mind, which guides its operations.

Without agriculture there is no wealth. Gold and silver are not wealth—they are its convenient representatives. Commerce produces no wealth—it simply exchanges it. Manufactures and the arts re-combine it. Agriculture is the prolific mother of wealth. The rest simply handle it when produced and delivered into their hands. The earth itself, originally, spontaneously produces wherewith to keep the race of man from starving—only whilst he is making ready to till the soil. Without it he soon degenerates into a wild animal, living here and there in small squads, a little superior to the other beasts of prey. The earth breeds savages. Agriculture breeds enlightened nations. It breeds houses and ships, temples and seminaries; it breeds the manufactory; sculpture, painting and music are its offspring. It would be folly to speak of the existence, or beauty, or power of any of these things, without agriculture.

The pulpit, the professor's chair, the scientific laboratory, the tripod, the library, the ship, trip-hammer, the loom and the anvil—all would go down in one generation. It is by the superabundant produce and stability of agriculture that all things exist. Nor gold, nor silver, nor diamonds could replace it. The state of husbandry, in any country, is the test of its enlightenment. The thermometer of civilization rises and falls as drives the plow. "You must send the plow," exclaimed a man who had traveled all over Christian missionary ground in heathen lands. A barbarian nation needs but to be plowed up—deep, subsoiled, continued, sowed, planted, and the inevitable harvest will be an enlightened empire. A practical, working agricultural society will dig barbarism, and mental and physical and spiritual poverty out of a nation, as effectually as any powerful grubbing machine will "shake out" the stubborn stumps.

A few centuries ago, a learned writer describes the times in these words: "Rude were the manners then, the man and wife ate out of the same trencher; a few wooden-handled knives, with blades of rugged iron, were a luxury for the great; candles were unknown. One, or, at most, two mugs of brown earthenware, formed all the drinking apparatus in a house. Rich gentlemen wore clothes of unlined leather. Ordinary persons scarcely ever touched flesh meat. In noble mansions, a little corn seemed wealth."

This is history. Any one of our neighbors, if compelled now to live as the highest and wealthiest of mankind lived in those days—such a neighbor would excite our sympathies. We would consider him as good as starving; would carry in gifts to supply his wants, and start a subscription among our friends to feed and clothe him.

A few hundred years ago, and all the wealth of a nation could not buy a loaf of bread, such as you will see on any farmer's table at the present time. The fine flour could not be made. The table of our farmer is much more princely in its furnishing, than was the table of a monarch then. We have now in common use several species of most delicious fruits then unknown. We raise several kinds of grain not then in use. The very word corn, then applied to wheat and barley, is now applied to a grain then undiscovered. Men then lived upon a few vegetables, with flesh on extraordinary occasions; and at their greatest feasts, their chief viands were flesh and wine. Their crops, as well as in the palmiest ancient times, rarely yielded over ten or twenty fold. Now a hundred fold is considered a very small return. Then, as in the ancient world, they gathered the harvest by pulling off the heads, pulling up the stalks, or by almost as slow a process of reaping with the sickle. Compare these methods with the great reaper now in use! that sweeps over acres in an hour, and leaves the glorious harvest on the fields of a farm in a day. Thus, formerly, the patient ox slowly trampled out the grain, week after week, and the winds of heaven and the fan in the hands of the laborer slowly and imperfectly separated the kernel from the chaff and straw. Now, the mighty thresher, with tumultuous whirl, takes into its crushing teeth thousands of sheaves in a day, and scattering the emptied heads, and straw, and chaff, in rich streams, the separated golden grain runs out upon the ravished sight, all ready for the marts of trade—for food for man and fowl and beast, and for the hopper and the stones, swiftly driven by the vast and ponderous wheel. From its mighty pouch comes out flour, white as the driven snow, which makes the kneaded bread better than the fabled ambrosia of the gods.

In short, Agriculture *clothes* all—Agriculture FEEDS all.

From Dickens' Household Words.

Our Bedfordshire Farmer.

It was harvest-time when we went down on our first visit to the friend, whom for anonymous distinction we will call the Bedfordshire farmer. We travelled by railroad of course, and were set down on a platform almost within sight of his hospitable chimney. In this roadside station, which is in effect an inland iron port, to a purely rural district, we have a specimen of one of the mechanical revolutions of modern agriculture. The fat beasts and sheep of this parish formerly required four days to travel along the road to market, at a loss of many pounds of flesh, besides growing feverish and flabby from excitement and fatigue; they now reach the same market calm and fresh, in four hours. If news of a favourable corn-market have arrived by the morning's post, fifty quarters of wheat can be carried from the stack, thrashed out by steam-driven machinery, sold, and the money returned in much less time than it would have taken merely to thrash out fifty quarters by the hand-flail.

The farmer himself met us on the platform—a disappointing personage, considering that he had been more than twenty years getting a living by growing corn and sheep; for he had not an atom of the uniform associated from time immemorial with the British farmer—no cord-breeches, no top-boots, not even gaiters, no broad-brimmed hat, not a large red face or ample corporation—in fact, was not half so much like the conventional farmer as my friend and fellow traveller Nuggets, of the eminent firm of Nuggets and Bullion, who cultivates eight and a-half acres at Brixton, on the most scientific principles, at an annual loss of about twenty pounds an acre. The Bedfordshire farmer looked and was dressed very much like any other gentleman not obliged to wear professional black and white. His servant, too, who shouldered our carpet bags, wore neither smock-frock nor hob-nailed shoes; he might have been the groom of a surgeon or a parson.

The Grange presented what amateurs in French would call more disillusionment. A modern villa-cottage, with one ancient gable and one set of Elizabethian chimneys, planted in the midst of a well-kept garden, with the regular three sitting-rooms of a suburban villa, reminded us that times were changed since Bakewell received crowds of visitors of the highest rank, including royalty, "clad in a brown metal-buttoned coat, a red waistcoat, leather breeches, top boots, sitting in the chimney corner of his one keeping room, hung round with dried and pickled specimens of his famous beasts." The book-shelves in one of our friend's rooms are filled not only with works on agriculture, but with histories, biographies, novels, and poems. The windows, fringed with monthly roses, look out upon the gardens, across a fence where a steep hill of pasture rises, once a deer park, still studded over with fine trees. There Suffolk horses, a long-tailed gray mare, some dairy cows, and Southdown sheep are feeding, and chewing the cud in the shade.

Our first visit was to the farm buildings, divided by a road from the nag stables and offices of the house, which therefore is not troubled with either the smell or the dirt of the farm-yard. A picturesque untenanted dovecote, half covered with ivy, is the only remaining monument of the farming days when five year-old mutton was fed, and wooden ploughs were used. Pigeons don't pay in cultivated countries. On one side of the occupation road leading to the first field of the farm, were the sheds for carts and implements; on the other the cattle yards, the feeding houses, the cart stables, the cow-house, and the barn-machinery and steam-engine. One-horse carts were the order of the day, a system far preferable to wagons, when each horse is well up to his work. Our friend's horses are always in good condition. The implements made a goodly display, eight or nine of Howard's iron ploughs, light and heavy, harrows to match the ploughs, a cultivator to stir the earth, and a grubber to gather weeds, drills and manure distributors, and horse-hoes, a Crosskill's clod-crusher, and a heavy stone-roller, a haymaking-machine and horse-rakes. These were all evidently in regular use; some for strong clay, others for light sand.

The cattle yards form three-sided squares, the open side facing the road and the sun, the other three sides bordered with covered feeding sheds, or verandahs, about which there was nothing remarkable, except that the roofs were all carefully provided with spouts, by which the rain that would otherwise flow into the cattle yards and saturate the straw, was effectually carried away into the main drains. The floors of these yards are dish-shaped, slightly hollow. In winter a thin layer of mould, covered daily by fresh straw, imbibes every particle of liquid manure. Under the treading of the beasts, which are turned in as soon as grass fails, there to feed on hay, turnips, and mangold wurzel, or corn, or cake, in turn, according to relative price and supply of the last—nothing is cheaper than oil-cake when it can be bought at a penny a pound—the straw made on the farm is converted into manure of the richest quality, which is in due time returned to the fields.

In every yard was an iron tank filled with pure clean water, by a tap and ball, which regulated a constant supply from a spring-filled reservoir, established on the hill that overlooked the Grange. These iron tanks were substitutes for those foul inky ponds, to be found as the only drinking places on too many old-fashioned farms. In the stable, which was carefully ventilated, we found a team that had done a day's work of ploughing, munching their allowance of clover and split beans. They were powerful, active, clean-legged animals, as unlike drayhorses as possible; the harness of each was neatly arranged in a harness-room, not tumbling above the dirty stable, as too often seen. The feeding house, where twenty-five beasts could be tied up and fed, was placed conveniently near the granary, and here again at every beast's chain-pole a perpetually full tank was to be found. The doors opened, so that the manure of the feeding houses could straightway be added to the accumulation of the yard.

Our Bedfordshire farmer does not indulge in fancy, in purchasing his cattle. Noblemen and owners of model farms adhere rigidly to some one breed, Devons, Herefords, or Scots, and have to pay an extra price to make up their number. He purchasses every spring or summer, at the fairs where cattle are brought from Scotland, Ireland, Wales, Devonshire, Herfordshire, and Yorkshire, for the purpose, one hundred good two-year-old Devons, Herefords, or Short-horns, or three-year-old Scots or Anglesea runts. These he runs on the inferior sward until winter; then takes them into the yards and stalls, and feeds them well with hay and roots—not exceeding a hundred weight of turnips a day—more would be wasted; to this he adds, from time to time, linseed and barley meal, in preference to oil-cake, which he generally reserves for sheep. He has experimented with cooked food, but has not found the result in weight pay the cost and trouble. In the spring these beasts are put on the best grass, and sent off to market as fast as they become ripe, having left behind them in the yards a store of manure available for all the land within easy carting distance.

On our autumn visit we saw in the empty yards and in the styes a few pigs of no particular breed, but all of that egg shape which betokens rapid fattening. As there is no dairy, the Bedfordshire farmer finds it does not pay to breed pigs, or feed more than just enough to consume what would otherwise be wasted.

Lastly, we came to a compact building forming the one side or wing of the cattle yards, marked by a tall chimney; here was a high-pressure steam-engine of six-horse power, under the care of a ploughboy, which put in motion the barn machinery, threshed and winnowed the corn, separated it into wheat, first and second, tailings, cavings, and chaff, and carried the straw into the straw house, and the wheat into the granary. The same engine also put in motion stones for grinding corn or linseed, or crushed beans, and worked a chaff-cutter.

The steam-driven barn apparatus has more advantages, and creates more profit to the farmer, than can be explained in a few words. Under the hand-flail system, a great barn was needed, where it was necessary to thrash, not when you wanted to send to market, but when thrashers could be had, and then very slowly, with great loss by imperfect thrashing and systematic pilfering. Our Bedfordshire farmer having had the building provided by his landlord, put up the steam-engine and machinery himself, at a cost of five hundred pounds; and now, with coals costing fifteen shillings per ton, his steam-engine thrashes and dresses two hundred bushels of wheat in one day, at a cost of one penny a bushel, which, with horse-power, would cost four pence, and with flail thrashing, six pence a bushel. Besides this economy in time and money, there is an economy in space, as the corn can remain in the rick in the field, until wanted.

Some very pretty things have been said about the flail; and thrashing does make a very pretty picture, although it is a most soul-deadening occupation. But to a thoughtful mind, there is something much more beautiful in the regularity with which the sheaves, delivered from the cart, are consumed and distributed. The steam-driven barn machinery was not a complete piece of work until linked, by the railway, with the corn-market. In Scotland machine-thrashing has long been universal, but in England it makes way slowly, and is introduced with excuses in some counties —our poor-laws having been in the way.

We next mounted our friend's hacks and climbed the hill to take a bird's-eye view of the farms before descending into details.

On our way we crossed a broad belt of grass fields which surround the house and garden, and are always mowed, other fields farther off being always grazed: by this arrangement it is thought that the best kinds of grass for feeding are cultivated on the one, and the best for mowing on the other; while the hay so grown near the yards where it is to be consumed, and near the manure heaps which restore fertility to meadows. Meadows round a house are, it must be admitted, much more agreeable than ploughed land, besides having the advantage of keeping the cattle and horses grazing within an easy distance if not within sight. After ascending a hill, considered steep in the midland counties, we stood upon a sort of inland promontory, marking the division of the farm, all above being sand-land of the character well known as Woburn sand, and nearly all below stiff clay, being part of the rich valley which runs on to the sea at King's Lynn in Norfolk.

From this promontory we could review, as in a panorama, the farmer's crops—wheat in great fields of forty, fifty, and sixty acres—a golden sea, fast falling before the scythe and the sickle; barley not so ripe, some of it lying here and there in rucks as if a great flood had rolled over it; too much manuring swelled the ears without stiffening the straw enough, and so anxiety to raise a large crop had defeated itself. There were oats too, verdant and feathery; beans, dark, ugly patches on the landscape; mangold, with rich dark green luxuriant leaves; and fields of something that was not grass, though like it in the distance, being, what is called in farmer's phrase, seeds, that is to say, artificial grasses, such as Italian rye grass, red clover, or white clover and trefoil mixed, which form a rotation crop only to be grown once in four or in eight years, according to the soil.

Experience and scientific investigation have but slightly and slowly added any new crops for the use of the farmer. When any one loudly announces a new crop, which will supersede all others in utility and profit, we may as safely set him down as a quack as if he announced a universal medicine. For England, wheat, barley, and oats, are the best cereal crops; rye, except green to feed stock, is not in demand; wheat in many varieties fits itself to suitable soils, the finest kinds cannot always be carried to a distant country without degeneration. The finest barley for malting is grown in a few counties on light soil, while oats attain a perfection in Scotland and Ireland rarely to be found in districts where oatmeal is not the food of the people.

The proportions which a farmer should grow of each crop will depend on his soil and on his market, supposing always that the landlord is, like our friend's landlord, sufficiently intelligent to allow his tenant to make the best of his land. For instance, having six fields on his clay land of about fifty acres each, he has found it convenient to adopt the following rotation:—First year, either a fallow or a fallow crop, such as coleseed, tares, early white turnips, mangold, &c.; second year, wheat; third year, beans; fourth year, barley; fifth year, clover; sixth year, wheat, instead of the Scotch rotation, in which beans stand fifth, and the land becomes too full of weeds for a good crop. On the same land the rotation is—first, turnips; second, barley; third, clover; and fourth, wheat; white and red clover being used alternately.

It will be observed that root crops form the foundation of this style of farming. Root crops do two things for the farmer; they prepare the land for corn crops, and they supply food for a great number of lambs and sheep. Under the old system, two hundred acres of this farm were poor grass pasture. Under the rotation named they feed more live stock than before, in addition to the crops of wheat twice in six years. Of course on six fields two are always in wheat. But on hundreds of thousands of acres of fertile *under-rented* land, the intelligent cultivation of roots is quite unknown; indeed, without security of tenure in lease or agreement, it cannot be practised because it takes six years to complete a never-ending circle of improvement. There are landed baronets, who having gone so far ahead as to adopt the short-horn, which superseded their grandfathers' long-cherished, long-horned, thick-skinned, Craven beasts, still look askance at guano and superphosphate—the best food for root crops—as condiments of revolutionary origin; and as for leases, you may as well speak of confiscation at once.

As we looked down the beautiful fertile valley, and gossipped over the cardinal principles of good farming, we could see the marks of vegetation, and here and there a landmark in a stately tree, where four miles of fences had seven years previously been cleared away, and superseded whenever fences were needed at all by double ditches, and rails arranged with mathematical regularity to protect growing thorns from the assaults of the beasts and sheep feeding around. Before coals came by canal and railway, hedges gave faggots for witter fires.

Turning our nags' heads upwards, we next traversed the sand half of the farm, an undulating four hundred acres, sprinkled over with many pretty wooded dells and bordered deep belts of plantation, where our friend, having the game in his own hands, kept up a fair head of pheasants and hares. Farmers seldom object to the game they may shoot themselves.

On the sand we found a different rotation, viz., turnips, barley, clover, and wheat; neither mangold nor beans.

The prettiest sight was our farmer's breeding flock of South Downs, feeding on a hill of seeds: four hundred black-faced, close-fleeced, firkin-bodied, flat-backed, short-legged, active animals, without a hollow or a bump on any part of their compact bodies, as like each other as peas, and as full of meat.

They were under the amiable care of an old shepherd, a boy, and a dog of great discretion—a real Scotch colley, who also attend to the whole sheep stock. It had cost our farmer twenty years of constant care to bring this flock to their present perfection, during which time he has tried and given up the long-woolled Leicester, of which half his sheep stock formerly consisted, finding the South Down more hardy and profitable on his land and with his market. The total sheep stock always kept on this farm amounts to one thousand herd, of which what are not bred on the farm are bought. Thus in the course of the year about one thousand sheep and lambs, and one hundred and fifty bullocks, are sent to market.

Now we had seen all the raw material for growing corn and wool.

Bullocks fed in yards in autumn and winter, on roots grown on well-drained, and hay on well-manured land, with corn and cake to finish them—these produce while getting fat, and tread down and solidify manure which is ready in the spring to be carted out where wanted, for growing more roots for green or hay crops. On the other hand, light land is consolidated and enriched by a flock penned upon it, and there feeding with turnips, corn, or pulse and cake. If they are store-sheep they are allowed to gnaw the turnips on the ground for part of the year; if they are young and to be fatted, the turnips are drawn, topped, and tailed, and sliced for them by a boy with a portable machine—a simple affair, and yet one of the most valuable of agricultural inventions. Thus feeding in the day, and penned successively over every part of a field at night, the sheep fertilize, and with their feet compress more effectively than any roller, light, blowing sand, and prepare soil which once would scarcely feed a family of rabbits on an acre for such luxuriant corn crops as we saw waving around.

What neither farm-yard manure nor sheep-treading will do toward stimulating vegetation and supply the wants of an exhausted soil, is done with modern portable manures, which do not supersede, but aid the home-made fertilizers of our forefathers.

Cantering on, now pausing to examine a root crop, then pushing through a pheasant cover, then halting to chat with the reapers, we came to a field of wheat on sand inferior to the rest. The choicest seed from the Vale of Taunton Dean had been used: but it seemed that, in this instance, what suited a Somersetshire valley did not thrive on a Bedfordshire hill. Such special experience a good farmer is continually collecting. Again: repeated trials had convinced the farmer that guano, the most valuable of all portable manures, was wasted on the sand; as, in the event of a dry season, the fertilizing powers were evaporated and entirely lost. On another fifty-six acres of wheat a most wonderful crop was being moved, estimated at six quarters to the acre. The extra weight could only be accounted for by the field having been rolled with more than ordinary care with a heavy iron roller. Nevertheless, amateurs must not rush off to roll their wheat fields, because on a plastic soil it would be total ruin to reduce a field after rain to the consistence of smooth mortar.

I have advisedly said, mow, not reap, several times in this narative. The Bedfordshire farmer has no doubt of the superior advantages of the former plan. Nevertheless, he reaps a few acres as shelter for the partridges. Mowing is done by peace-work, at per acre. Formerly the harvesters received so much money per acre, and five pints of beer for a day; but the farmer having one July day expressed his discontent to a party of mowers snugly lying in the shade, pipe in mouth and beer-can in hand, at the slow progress of the work, was answered with fatal candour by a jolly foreman: "Maister, we come here to drink your good beer, and as long as you give us five pints a day we beant agoin' to hurry the work." From that season an additional shilling per acre replaced the five pints of the mowing charter; and there is no lagging. Mowers are not the only people who like idleness and five pints of beer a day.

It was brilliant weather on the second day of our visit. Carts, each drawn by one clean-legged horse, were at work at a pace that would have choked the old harry-legged breed. The picturesque wagon, with its long team, is disappearing fast from modern harvest-fields. The horse-rake, following the binders, leaves little for the gleaners.

While the carts were at work in one field and the mowers and binders in another—for there were two hundred acres of wheat on this farm—in a fallow-field a party of boys were cross-plowing with some of Howard's beautiful wheel plows, which can be managed by boys of thirteen, for such work the object being only to pulverize the land. On almost any land the superiority of the iron-wheel plow is incontestable.

We rode back through a great grass field, well dotted with shady trees, under which shorthorns, Devons, Herefords, and black Anglesea runts were comfortably chewing the cud; all the different breeds being found profitable to feed when bought at a proper price as the account books of our friend, carefully kept for twenty years, distinctly show. From the horned stock and the sheep, a draught of the fittest and fattest were sent to Smithfield every week from May to the following March, and replaced by fresh purchases from the neighbouring fairs.

After dinner, while looking out between rosebushes at the cattle on the hills, we talked, of course of framing past and present—of what practice and science had done, and what it could and could not do for farmers.

In what we had seen there was nothing startling, although the results, as to quantity of produce in corn and meat in a year, would have been incredible if foretold to any brown-coated farmer in seventeen hundred and fifty-four. There was no land wasted by fences or devoured by weeds; there was no time lost—one crop prepared the way for another; there was no labour lost—horses and men and boys were fully employed. The live stock for market was always full fed; the breeding-stock was kept up by retaining only the best-shaped ewe lambs, and hiring or buying the best rams from skilled South-down breeders. So the farm was continually sending to market a succession of lamb, mutton, and beef.

All this requires for success some considerable skill and experience, and not a little expense. Twelve or thirteen hundred pounds a-year for rent, and as much more for wages; two hundred a-year poor's-rates, no tithes; three hundred a year for corn and cake purchased; one hundred and fifty pounds for portable manures. A capital laid out in two hundred store beasts, which cannot be bought for less than ten pounds each, and four hundred breeding ewes, worth two pounds ten shillings each—also thirty carthorses, worth forty pounds a-piece on the average, and all the agricultural implements, too. So, in round numbers there was evidently without asking impertinent questions, some ten thousand pounds invested.

The labour of this farm would in its number astonish a farmer of the old school of anti-steam-engine prejudice, as much as the implements. It consists of about twenty men and thirty boys. Of these, six men are plowmen, and have the care of four horses each, being assisted by two sets, of which the younger consists of fifteen boys between the ages of eleven and thirteen, who are under the command of a steady experienced farm-labourer. He never has them out of his sight; under his orders they do all the hand-hoeing of wheat, thin out turnips, spud thistles out of grass-land, gather the turnips into heaps for tailing, carry away the straw from the threshing-machine, bring the sheaves from the stack to the man who feeds the machine, and do other work suited to their strength. When the harvest is off, and repeated plowings have brought the couch-grass roots to the surface, they gather it in heaps and burn it. A great bare field dotted over with heaps of this troublesome weed, each on fire, and each industriously fed and tended by an active little boy, presented a very amusing sight to us in a second visit to Bedfordshire, in October.

Thus these boys are trained to work regularly at all kinds of farm labour, and form a regiment of militia from which the regular army of the farm is recruited. The most intelligent are promoted to be plowboys, and grow up to be very useful men.

They receive three shillings a-week wages, and every week, if well-behaved, a sixpenny ticket, which, once a year, in September, is converted into money to be laid out in clothes. The stoppage of a ticket—a very rare occurrence—is considered not only a loss, but a disgrace. In harvest time they receive double wages, and double tickets.

Such is a short view of the system on a well-manured corn and wool farm.

If able to lay out the needful capital skilfully, and manage the men, boys, and horses needed for a thousand acres of average corn and sheep land, the farmer, on an average of years, can reap a fair return for his risk and labour. He cannot under ordinary circumstances, expect to make a fortune except by saving out of ordinary income; for there are no patents, or secrets, or special undiscovered markets for farmers, as there are for clever manufacturers. Those who undertake to do wonderful things in agriculture invariably sacrifice profit to glory. But the skilful farmer is not tide to a day, a week, or even a month, except at harvest or seed time; he lives among pleasant scenes, socially and hospitably, and runs not the risks and endures not the sleepless nights of the manufacturer, whose fortune depends on the temper of a thousand hands, and the honesty or good fortune of debtors on the other side of the globe.

From the Kentucky Farmer.

Sheep Husbandry in the West.

Sheep are among the most valuable domestic animals subjected to the use of man, feeding him with their flesh, clothing him with their wool, and enriching him by their rapid increase; and, although they do not either draw or plow for him, yet, by proper management, they will greatly assist him to clean the weeds and briars and bushes from his farm, as they will devour almost every green weed but the mullen and pork.

Though they do not appear to be of equal value in the West to the horse, or the cow, or the hog, yet it may be confidently asserted that in no other mode could our agricultural wealth be so suddenly and so greatly increased as by the general slaughter of dogs, which would certainly be followed by the universal introduction of sheep on the farms of our cultivated districts, and also by the general dissemination of millions of them over all the hilly and mountainous regions; and quickly wool would become one of our largest exports, and millions of acres of waste lands would become a source of great revenue to the Commonwealth.

But, notwithstanding the loss, vexation and insecurity occasioned by dogs, (which are the only obstacle to this unbounded success,) still almost every farmer will find it advantageous to keep at least a few sheep; and the period of shearing is a good time to take a new, or an improved position on the subject. He who has no sheep should buy some now, and he who has some will find this the best time to improve them by selection, for now the bad ones appear in all their "naked deformity," and the good ones are seen in unexaggerated excellence.

Every sheep which is in declining years or is defective in size, form, thrift, or fleece, should now have a mark put upon it, and be in process of preparation for being converted into mutton before the next winter.

An animal which will thrive in the open air, without shelter, with a constitution able to resist disease, and with power to cope with murderous dogs, with a large carcass of good mutton, clothed with a close and heavy fleece of wool of medium fineness—this is the animal which we want in sheep, and nothing short of this will meet the public taste. This we have already got; or, if we have not, we may certainly obtain it, for a skillful, careful and persevering breeder will find the animal almost as plastic in his hands, from generation to generation, as the potter does his clay.

In the selection of a breeding flock the maxim that "like will produce its like," should be ever held in bright remembrance, and especially no male or female should be accepted which has the taint of hereditary disease upon it, for it will be probably transmitted to the offspring. Let the ewes be from one to five years old, with small heads without horns, and with rather long and smooth faces, straight broad backs and full round bodies. The fleece should cover the whole body up to the face and forehead, under the belly, and down to the knees; and it should be as uniform in length and fibre, over the whole body, as possible; and as free as possible from coarse and hairy locks on any part. A waivy appearance is not objectionable, but it should not amount to kinking and curling. A moderate degree of yolk is evidence of health, and conducive to health by rendering the fleece impervious to rain, and it preserves the texture of the fibre; but an excess of it is exhausting to the animal, and promotive of foulness in the fleece, and should therefore be avoided.

During the summer, the ewes should run apart from the bucks, and they should frequently be changed from one pasture to another, by which their fondness for roaming will meet with innocent indulgence; they will subsist almost entirely on weeds of different sorts, and on briars and bushes; and the health of the flock will be greatly promoted. When they begin to huddle together in the shade, and to hang their heads and stamp their feet for protection against the *sheep fly*, additional exemption will be secured by smearing some tar on the forehead, and also on the nose, in the mucus of which the fly seeks to deposit her eggs.

They should at all times have access to salt, and the best plan is to place it around the roots of some tree which you wish to kill, or some stump which you wish to extract. The salt is made more conducive to health by the occasional addition of flour of sulphur, and also of wood ashes.

A table-spoonful of flour of sulphur and and a pint of hog's lard mixed together, and a little of it smeared on the backs of each sheep when the fleece is short, will be the best protection against ticks.

The mean period of gestation with ewes is about one hundred and four days; and in this latitude the best time for impregnation is about the middle of October, so that the lambs may come after the cold weather has passed, and the ewes may have green food in abundance when suckling their young. To facilitate copulation many very wooly ewes will require some clipping about the tail, (which should not be omitted,) previous to the introductions of the ram.

He should, if possible, be a paragon of excellence in every respect; for every quality which he has, good or bad, will be impressed, with almost unfailing certainty, upon his progeny. Those qualities of fleece or carcass which are the chief object of the breeder, should by all means be developed in the ram in the highest degree, and they should be deeply implanted in his character. He should be not less than one year old, and should by no means be in declining life or health.

He should especially excell in the peculiar qualities of his breed, whatever they may be. He should have commanding size, and masculine appearance, broad shoulders and rump, wide back, full round body, deep brisket, and he should be covered all over with a full, close, uniform, soft and golden fleece; and be in all respects the best of his breed; and it should be remembered that breed or blood is of no value except so far as it possesses and insures the qualities which are desired. When more than one ram is used in the same season, the ewes should be carefully selected, and be so bred that the superior excellence of each ram shall compensate, in the progeny, some fault or defect in the ewes; for example, the smallest ewes (other things being equal,) should be bred to the largest ram, &c.

Notwithstanding the astonishing fecundity which has been ascribed to the ram, I would not recommend (from my own experience and observation,) over fifty ewes to be allotted to one ram; and that not more than ten should be put with him at the first time, and ten more be added at the expiration of five days; and so on until the whole fifty are put with him. The energies of a buck will be greatly spared by putting each lot of ewes with him late in the evening, so that he will have the cool nights for his operations.

To be sure that the ram is copulating well, it is desirable to smear his breast, before introducing him, with some lamp black venetian red, or spanish brown, mixed with hog's lard, so that each ewe will be slightly colored on the rump after copulation. When two rams are used they should be kept in different enclosures, and should be smeared with different coloring matter; and when it is desired to know their progeny apart, the ram and his ewes may have similar holes put in their respective ears, by round force used for that purpose, and the similar holes in the ram's ears should be put in the ears of his lambs.

When two or more bucks are used in the same season, this precaution will be necessary to prevent a ram from being bred to his own progeny in future, which should never be done if it is possible to avoid it, no matter how great is the excellence of the ram in question. Even after the ewes have all been bred and put together, it will be well to allow the best ram to continue for a while with the flock, for some ewe may have missed conception; he will be a protection to the flock, and even after conception his constant presence may not be without its effect in impressing his qualities and appearance on his progeny. The other bucks may be put with the wethers, or even together, by noticing that they do not fight for a few hours after being put together.

During gestation the ews want no better keeping than the range of a woodland pasture well set with blue grass, with a fresh and plentiful allowance of stock fodder scattered on the ground to them every other day during the snows and cold of winter; and during the severest weather they will need no other protection than their own fleeces, if they have been bred with systems and constitutions properly adapted to such treatment in this climate.

They should be kept as quiet as may be convenient; and the constant presence of fat bullocks, or of cows and calves, will be a protection against rascally dogs, which should not be allowed to run among them. In the absence of all other and better laws to prevent this, strychnine may be the indispensable though disagreeable resort.

The ewes being thus kept in good condition during the winter, as soon as they begin to expand their udders in the spring they should be put on a good pasture of fresh blue grass, timothy or small grain. If the meadow is luxuriant it will not be hurt by allowing the sheep to graze the foliage for awhile, but it should not be closely pastured.

If any of the ewes become loose in their bowels and foul behind, they should have all the wool carefully cut away, and the affected parts should be carefully rubbed with dry ashes. For this purpose it is well to have, convenient, a pen large enough to contain the flock, in which should also be a few close and sheltered pens, in which to put a ewe which in future might disown her own lamb, or be made to take that of another.

If any of them should be lame, they should now be carefully caught and examined by at least two hands, to avoid worrying them in catching, or hurting themselves by struggling. Should the horn of the hoof have grown too long at the toe, or be turned under the sole of the foot, pare it off carefully and closely with a sharp knife. Should a sore be found in the cleft on the heel of the foot, cleanse it well, and apply spirits of turpentine; or an ointment of alum, bluestone, or verdigris, mixed with lard, tallow or tar, according as the reason and circumstances may require. Should malignant foot-rot appear, pare with a knife, and then wash the diseased places well with a solution of chloride of lime to purify them, and apply and wash well with chloride of antimony and spirits of hartshorn a few times. But the better plan is to prevent all diseases by wide and frequent crossing, by keeping the sheep in the open air, and by often changing the feeding and sleeping grounds, and by keeping them on the highest and driest and poorest points of the farm.

As the period for yeaning approaches, the ewes should be put on good green pastures, and they should be kept on the best which can be afforded them after the lambs have come. They should not be allowed too much range, or be subjected to any unnecessary disturbance, while the lambs are coming, which might often cause them to loose or abandon their lambs while they are quitè young.

When the lambs begin to come, (which will be about the middle of March,) a careful and observant man should pass quietly among the flock at least twice a day, to render such protection and assistance as may be needed; and for this purpose he may have some work, of any sort, not far from the flock.

Should any crows be about, they should be well supplied with strychnine put on an *after-birth;* or on the eyes and bowels of a dead lamb. Of course no honest dog or hog will have access to this pasture, and all others will deserve the same fate as their murderous brother crow. Let the dead trophies be hung up by the legs, and the other crows will soon take warning, and give that pasture a wide berth.

A case of natural labour will not last over two hours; and in a natural presentation the fore feet will first protrude, and be followed by the nose, &c.

Should any difficulty be noticed by the shepherd the ewe should be driven to the pen, and be carefully laid upon her side, and the required assistance be given before the lamb has died. If twins present simultaneously, one of them must be pushed back until the other is safely delivered; when, after ten or fifteen minutes rest, the other may be assisted, if necessary. Some improper presentations may be *turned* successfully; and where a large head is the only obstacle, all the assistance required will be slow and gentle pulling, in unison with the efforts of the ewe. At the close of such labours, the parent and offspring should be left together on a straw bed, in the warm pen, for an hour or two; and should the lamb fail to suck in that time, assistance should be given to it; and as soon as the lamb is able to walk a little, it and the mother may be quietly removed to the pasture again. If a ewe should desert her own lamb, penning them together, and feeding the ewe bountifully for a day or two, will generally be all which will be necessary; but it will be proper to halter also a ewe to which a motherless lamb may be given, until she shows attachment to it.

As soon as the lambs have generally come, and not later than the first of May a cool evening should be selected, the flock, should be slowly driven to the pen, so as not to warm the blood of the lambs by undue exercise, and the shepherd should proceed to castrate, dock and mark them as quietly and as rapidly as possible.

To perform the first operation, the attendant should hold the back of the lamb, head upwards, firmly against his breast, while he stands erect, holding the right legs in his right hand, and the left legs in his left hand, and holding the hind legs open. The operator should take off with a sharp knife, about one half of the scrotum at a stroke, when the testacles will protrude; a gentle stroke with the knife will bring the testacles through the inner skin, from which another cut will disengage it, and another will separate the cord, well drawn out, and near to the body; and so proceed. Mark the ears, and then cut the tail off close, at a stroke; and then smear some tar and greese on the scrotum, head and tail, with a small paddle, all of which a dextrous operator will perform in from one to two minutes for each lamb. They should be laid quietly over the fence, out of the pen; and the ews had better be kept within small range until morning, by which time the cool night will have closed up the veins and stopped the flow of blood, and the lambs will have regained their strength, and will be able to follow. Now will be a good time to attend to any ewes which will again require tagging and rubbing with dry ashes.

The lambs should be smeared on the back at shearing time with a little sulphur and lard mixed together; or about two weeks after shearing time they may be dipped, up to the eyes, in a decoction of tobacco, made just strong enough, by experiment, to kill a tick, should they be infested with these vermin.

After docking, &c., the lambs should be noticed to see if any flies have deposited their eggs on the bloody places, and the skippers, if any, should be carefully washed off with a strong decoction of alder leaves or bark and soap, and more tar be added.

About the first of August all of the buck lambs should be taken from the flock; but the ewe lambs may be suffered to remain a month longer, when they should be removed; and they should not be bred to a ram until the fall after they are one year old.

With these simple precautions and this little care, one hundred ewes have raised from one hundred and ten to one hundred and twenty lambs; and, by having taken the trouble of r. ising by hand, still more might have been raised.

Nothing has been said about washing sheep. It is a troublesome operation, and a dangerous one to the health of both the sheep and the operator, and therefore should be avoided if possible. Such sheep with such fleeces as have been described, do not require to be washed before being shorn. The wool has just enough yoke in it to aid it in giving adequate protection to the sheep, and enough to prepare it to be carded and spun into coarse fabrics just as it is taken from the sheep. It will also receive bark and other domestic dyes, except indigo, without being washed. Such sheep will yield from eight to fourteen pounds of wool, which will readily sell at from twenty-five to thirty cents per pound. The fat weathers will sell as from ten to twenty-five dollars per head, as the mutton is equally as good as that of the South Down and there is much more of it.

The shearing of the sheep is an operation of so much importance that it will be made the subject of a separate article, at some future time.

R. W. S.

New Frankfort, Ky., June, 1859.

[The Beneficial Influence of True Science.]

Every one is aware of the beneficial tendency of genuine science; but it is not, perhaps, always duly remembered, that every practical application of the principles of mathematical, mechanical, chemical or physiological philosophy, is a new affirmation of the Divine benevolence towards man. Shall we say, it is a fresh text, translated from the unwritten Bible of God's creation, corroborating our faith in the paternal care of Him in whom we live, and move and have our being? And this might be said even if these beneficial discoveries were the results of chance. But when they come to us as the product of laborious intellectual operations, they assert the same great truth with a peculiar emphasis, in as much as they not merely declare the Divine purpose—that man should be well accommodated, and aided, and comforted, in this his terrene abode; but that he should win every advantage by the exertion of his higher faculties. Each benefit derived from a better knowledge of nature is a premium of mind—a boon given as the reward of intellectual effort: and while it declares in one of its inscriptions that the maker of the universe is the friend of man, in the other it exhorts man to be his own friend, by the diligent employment of his mental powers.

Every branch of modern science abounds with instances of remote correspondences between the great system of the world, and the welfare of man in the artificial (*the truly natural*) condition to which knowledge raises him. If these correspondences were single or rare, they might be deemed merely fortuitous; like the drifting of a plank athwart the track of one who is swimming from a wreck. But when they meet us on all sides and invariably, we must be resolute in atheism not to confess that they are emanations from one and the same centre of wisdom and goodness. Is it nothing more than a lucky accommodation which makes the polarity of the needle to subserve the purposes of the mariner? Or may it not safely be affirmed both that the magnetic influence (whatever its primary intention may be) had reference to the business of navigation—a reform incalculably important to the spread and improvement of the human race; and that the discovery and the application of this influence arrived at the destined moment in the revolution of human affairs, when, in combination with other events, it would produce the greatest effect? Ner should we scruple to affirm, that the relation between the inclination of the earth's axis to the conspicuous star which, without a near rival, attracts even the eye of the vulgar, and shows the north to the wanderer on the wilderness, or on the ocean, is in like manner a beneficent arrangement. Those who would spurn the supposition that the celestial locality of the sun, immeasurably remote from our system, should have reference to the accommodation of the inhabitants of a planet so inconsiderable as our own, forget the style of the Divine works, which is. to secure some great or principal end, compatibly with ten thousand lesser and remote interests. Man, if he would secure the greater, must neglect or sacrifice the less: not so the Omnipotent Contriver. It is a fact full of meaning, that those astronomical phenomena (and so others) which offer themselves as available for the purposes of art; as, for instance, of navigation, or geography; do not fully or effectively yield the aid they promise, until after long and elaborate processes or calculations have disentangled them from variations, disturbing forces, and apparent irregularities. To the rude fact, if so we might designate it, a mass of recondite science must be appended, before it can be brought to bear with precision upon the arts of life. Thus, the polarity of the needle, or the eclipses of Jupiter's moons, are as nothing to the mariner, or the geographer, without the voluminous commentary furnished by the mathematics of astronomy. The fact of the expansive force of steam must employ the intelligence and energy of the mechanicians of an empire, during a century, before the whole of its beneficial powers can be put in activity. Chemical, medical, and botanical science is filled with parallel instances; and they all affirm, in an articulate manner, the two-fold purpose of the Creator—to benefit man, and to educate him. * * *

[ISAAC TAYLOR.]

A Good wife who Found "Good in Everything."

A farmer was once blessed with a good natured, contented wife; but it not being in the nature of man to be satisfied, he one day said to a neighbor, he really wished he could hear his wife scold once, for the novelty of the thing. Whereupon, his sympathising neighbor advised him to go to the woods and get a load of crooked sticks, which would certainly make her as cross as he could desire. Accordingly, the farmer collected a load of the most ill-shaped, crooked, crotchety materials that were ever known under the name of fuel. This he deposited in its place, taking care that his spouse should have access to no other wood. Day after day passed without a complaint. At length the pile was consumed. "Well, wife," said the farmer, "I am going after more wood; I'll get another load just such as I got last time." "Oh yes, Jacob," she replied, "it will be so nice, if you will; for such crooked, crotchety wood, as you brought before, *does* lie around the pot so nicely."

From the New York Observer.

Scientific.

THE DAY PROBLEM.

The variation of clock time with the difference of longitude, presents to a mind not accustomed to reflect upon it, a somewhat serious puzzle. Yet I think it can be so unfolded, as to be plain to the most ordinary capacity.

Clock time is relative, and varies in different places as they vary in longitude. Taking any given point, all places east of it are in advance, and all places west of it, behind, in relative time; the difference being just one hour for every fifteen degrees of longitude; and for every greater or less number of degrees, in the same proportion, greater or less than one hour.

It is easy, therefore, to see, that if one journeys eastward or westward from any point, having with him the true time of his place of departure—say New Orleans—when he has reached Philadelphia or Santa Fe, or any places on their respective meridians, by travelling east or west; in the former case he will have gained one hour in relative time, and in the latter, he will have lost just one hour. And so of all greater distances, in the same proportion. Now let us apply these principles on a larger scale.

A ship sails from the harbor of New York *east* 180 degrees of longitude, say to Batavia, near the western end of the island of Java. In that distance she will *gain* in relative time, 12 hours; that is, when it is Saturday, 6 P. M., at New York, her point of departure, it will at the same time be Sunday, A. M., where she now is, at Batavia—reckoning the days, in both cases, by the apparent revolution of the sun.

Another ship sails from the same port of New York, westward, around Cape Horn, through the Society Isles, &c., passes north of Australia, and reaches at length the same point, the city of Batavia, making 180 degrees of longitude. She has *lost* in relative time just 12 hours; that is, when it is Saturday, 6 P. M., at New York, it will be 6 A. M., of the same day, at the place where she now is.

Therefore, in general, persons sailing in opposite directions, east or west, and arriving at the same meridian, whether in the same or in different latitudes, if they have each kept a true account of the days of the week, by the rising and setting of the sun, will differ just twenty-four hours in relative time; that is, whatever may be the day, and the hour of the day, in the reckoning of those sailing westward, it will be the same hour of the day, but one whole day in advance, with those that sailed eastward. And should the two ships, in the cases above stated, after a temporary stay at Batavia, pursue their respective courses; the eastward bound vessel doubling Cape Horn, and at length making the harbor of New York; while the one westward bound reaches the same point by the Cape of Good Hope, their difference of day-reckoning would amount to two whole days exactly; that is, if to the sailors arrived by the way of the Horn, it is Monday, 11 A. M., to those who arrived by the other way, it will be the same hour of Saturday, while to the citizens it will be neither Monday nor Saturday, but the Sabbath day, and the church-going bells will be summoning the multitudes to worship God in his earthly courts.

Again: suppose a company of Russian emigrants to sail from the port of Archangel, on the White Sea, *eastward* through the Arctic Sea, along the coast of Asiatic Russia, and through Bherrings' Strait, until at length they reach the *western* shore of North America. Suppose other companies, from time to time, to make Holland, France, Germany, and England their starting points, and committing themselves to the Atlantic and sailing *westward,* to find their way to the *eastern* shores of the same North America, and thence to spread westward, until they at length arrive at nearly the same meridian with the Russian emigrant. As both the eastward and the westward emigrants would carry with them the days of the week, reckoned by the rising and setting of the sun, it would of necessity result, that the Russians, in the case supposed, would gain in relative time, in proportion to the longitude traversed, while the other emigrants would lose in the same proportion; so that, if they all at last should settle on the same meridian, no matter what their latitude respecttively, they would differ just one day in day reckoning; yet both would be right. Now the above supposition has been realized, and is a plain, historical fact. Russia, of the one part, and Great Britain and the United States of the other part, have together practically wrought out the geographical problem of the discrepency of day reckoning, under the above conditions.

In the light of these facts one can easily understand,—what must seem an anomaly to the person who has not reflected on the subject,—why, at New Archangel, on the island of Sitka, near the western coast of North America, the day-reckoning should be one day in advance of the reckoning of Victoria, on Vancouver's Island, and of Washington and Oregon, just a little to the south. The one place being a possession of Russia, was settled by eastward emigration; while, with respect to the other places, the current on whose bosom was borne the precious freight of letters and Christianity, pursued a westward course. The discrepancy in the above instance, and in the similar one which obtains between the southern and the central islands of the Pacific, will ever remain as incontestable and most striking memoriats of the great fact, that the tide of civilization reached those distant parts of the world, by flowing in opposite directions. W. P. V.

Manipulated Guano.

We notice by the last Southern Planter that Frank G. Ruffin, Esq., former editor of that journal, has commenced the Manipulation of Guano at Richmond. We also learn that several very respectable houses in Petersburg, Alexandria, and other places, are also engaged in the same business. In this city there are five or six establishments for the same purpose, and during the last spring we were induced to enter into it also, but on a very limited scale. The number of persons engaged in it will, no doubt, create a competition which will soon bring it to a fair paying price. Were it not for the difficulties thrown into the trade, by the attempts of the Peruvian agents to prevent manipulators from obtaining supplies of the Peruvian Guano—which is the main basis of the manipulated—and thus causing a heavy outlay of capital, which, under other circumstances, might be avoided, we think there would soon be room for a reduction in price. We have uniformly advised farmers to buy the ammoniacal and phosphatic guanoes and manipulate for themselves; but if they are indisposed to take the trouble, then we will supply them with an article which we flatter ourselves will be found at least equal to any prepared, from the effects of which on the spring crops we have some very flattering accounts. We make this statement at the risk of again being charged with being actuated by *selfish* motives, in our efforts to counteract the late monopoly in Peruvian guano. This mixture of Peruvian and phosphatic guanoes has been found eminently successful in England, as well as in this country, and we have for years past been urging its adoption upon our farmers. We believe that the results of this article in England is the cause of the early and persistent efforts of the Peruvian agents and government to obstruct its free use here, and every means have uniformly been used by them to prevent the manipulators from obtaining supplies for their purposes.

Rural Register.

Manufactures.

The principle of association in production has been invoked in many ways by writers and theorists, and various plans have been laid down, by which the profits of labor might be increased in the hands of those who do the work, but without much success. The result has been almost inevitable, that some individuals get all the profits while the mass of laborers get only a precarious living. The principle of association in a division of labor is no doubt sound, and the greatest good has been derived from it. It is only its application which has been injurious. The communist principle of having all the workmen proprietors, has been tried in France thoroughly, and has failed completely. It was found that the talents, capabilities and business energy necessary to success, must be centred in a directing head, and that a small per cent. on the amount earned by each workman, did not more than compensate the owner for his services and risks. The workmen obtain more for their work where the owner is prosperous than where they are all proprietors, and divide the profits. In the United States, on the other hand, the corporate system has been tried, and may be said to have failed because the non-working officers get all the profits of the concern. A corporation is always a monopolizer. It is born of speculation. It commences in a grasping spirit, by purchasing large tracts of land, in the midst of which it sets up its mills. It then draws to its mills, by promise of good pay, constant work and facilities for cheap living, whole families, and large number of single men and women, who find that the promise of "constant work" is faithfully kept, but that the promise of "good pay" and "cheap living" are kept only to the ear, while they are broken in reality.

As the corporation grows, it erects new offices, to which enormous salaries are attached. These opening and increasing leaks draw largely upon the profits, and seriously threaten to swallow up the dividend that stockholders are expecting. But it will not do to disappoint them. Accordingly, to meet the exigency which the managers of a corporation have produced, the price of labor must be reduced to the lowest possible figure. Hence we see able bodied men working for an average of 80 cents a day, while parasites upon the corporation are receiving $5,000 a year for doing nothing; hence we see, when a crash comes, deficits of hundreds of thousands which cannot be accounted for.

The true system for cheap production seems to be that which has been so successful in England. Individuals with their own means conduct each his own branch of any particular manufacture with increasing skill and economy. The general result is quality and cheapness of goods, which the corporate system cannot rival under any tariff.

U. S. Economist.

The Oldest Inhabitant's Opinion of Rail-Roads.

The last number of the Knickerbocker Magazine, in the editor's table, gives the opinion of the "oldest inhabitant" in one of the far-off shore towns of Massachusetts Bay, touching railroads—his experience consisting in having seen the end of the road laid out and the cars running upon it. He remarked to a visitor—"What kind o' 'commodation be they? You can't go when you *want* to go; you got to go when the bell rings, or the noisy whistle blows. I tell you it's payin' tew much for the whistle. Ef you live a little ways off the deepot, you got to pay to *git* to the railroad; and ef you want to go anywheres else, 'cept just to the eend on it, you got to pay to go arter you get *there*. What kind o' 'commodation is *that?* Goin' round the country tew murderin' folks, runnin' over cattle, sheep and hogs, and settin' fire to bridges, and every now and then burnin' up the woods. Mrs. Robbins, down to Codpint, says, and she ought to know, for she's a pious woman, and belongs to the lower church—she said to me, no longer ago than day 'fore yesterday, that she'd be blamed if she didn't *know* that they sometimes run over critters *a purpose*—they did a likely shoat o' hern, and never paid for't, 'cause they was a 'corporation,' they said. What kind o' 'commodation is that? Besides, now I've lived here clus to the deepot, ever sence the road started to run, and seen 'em go out and come in, but *I* never could see that they went so dreffül *fast*, nuther!"

From the Tobacco Plant.

Are Birds Worth their Keeping?

Beecher is very good on birds. It could be wished he was as orthodox on other subjects as on ornithology. Some farmer complains to him through the Independent, that he can't get his ripe cherries, for the birds, and what must he do? Shoot the pretty things, and have cherries instead of songs? The following is the reply:

There is no unmixed good in this world except dying, which cures all ill and inherits all blessing. But while living, what is there without an admixture of evil? Even that wife, who properly restrained you from harming the birds, and evidently a good woman, has probably some slight infelicities of disposition. The very children that carry the doubled excellencies of their parents, have they not some strokes of mischief? Indeed, sir, do you not find that you are obliged to take even yourself with some grains of allowance? Why, then, should you demand that birds should be more perfect than anything else in the world?

Let us state the case. Although birds undertake to furnish you with the most admirable amusement, and with music such as no orchestra could be hired to give, they do not charge you a penny for their services. You never have to wake them. You have no care of their toilet. You are asked to provide nothing for their breakfast, nothing for dinner, nothing for supper. They draw on you for no linen for their beds, and no space for tenement room. They come to you early in the spring; they stay with you till the red leaves grow brown, and even then they leave a rear-guard to watch the winter, and every bright day till after January is sentineled with some faithful, simple bird on duty.

And what is the service they render? A thousand sparrows there are, without remarkable song, but whose very name recalls to you the memorable words of Christ. There is not another truth more needed and doubted by sorrowing and hard used men than that of God's personal care over human interests. There is scarcely a land on the globe, now, where the Bible does not say to men, "Are not two sparrows sold for a farthing? And one of them shall not fall to the ground without your Father." And there is scarcely a rod of ground on the earth where this little bird does not flit before our eyes every day, tiny, homely, with only a chirp for a song; but a text-bearer, a mission-bird, a remembrance to every discouraged soul of Christ's words of sweet assurance. I would feed a thousand sparrows with all the cherries that their little crops could carry, for the sake of that very truth God has associated with their name, and which they recite to me every day. For what cherry or currant or berry that they pluck from my trees can be worth to me what that fruit is which they bring to me from the Tree of Life?

But there is another sparrow—the tribe is large—the song-sparrow, whose note is sweetest, we sometimes think, of all the summer's birds. It is a perpetual songster. It comes early and stays late. It sings all day. We have heard its soft, clear and exquisitely sweet little snatch of melody from out of trees overhead, at two o'clock on a sultry day, with the thermometer at ninety degrees, and no wind stirring! Is not that fidelity? Dear little soul, I would give it all the cherries on the place for itself and fellows, and bushels more if it will deign to confer upon me still the favor of such sweet utterance! For, in good sooth, men are the beneficiaries and birds are the benefactors! It is arrogance and egotism for us to regard insects, birds and innocuous beasts as honored in our mere tolerance! They, too, are God's creatures. They, too, are a part of the filling up of the grand picture of his earthly cathedral. They have an errand of their own, a place of honor; and no one is to despise or patronizingly to *condescend* to notice that which God made and makes, and rejoices over in every land and field upon the globe!

Next to these, we hear every day, just

now, the *wren*. A pert, *petite*, smart, brave little animated spark is he! His song is a twisted thread of sweetness. His amazing assiduity in doing nothing is quite edifying. He is brave in battle, as human bustling do-nothings seldom are, and will whip twice his weight of martins and swallows.

But none of these mentioned birds are particularly fond of fruit. Seeds and insects form their diet in chief. The same is true of that artist, the bobolink, that sings at the North in black and white livery; but going South changes his coat and his note, and, like many another Northern-bred black-coat, drops into good living, and grows fat in the rice swamps, and forgets to use his voice except to call for food, or raise an alarm cry when there is some danger of losing what he has got. The chief depredators of the garden are, the robin, blue jay, the oriole, and the pea bird, or wax-wing.

A man that would shoot a robin, except in fall, when, in flocks, they are gathered together, to caravan the air in their long pilgrimage to Southern glades and forests, and then really and conscientiously for food, has in him the blood of a canibal, and would, if born in Otaheite, have eaten ministers, and digested them too.

Indeed, if it were not too much trouble to re-write what we have said of the song-sparrow, we would say that the robin is our sweetest summer singer. This universal favorite has a variety of songs. All are sweet, but one rises far above the rest. At evening, the sun gone down, the cows returned from the pasture, the landscape radiant in its salient points, but growing dim and solemn underneath, then, as you sit musing in your door, you shall hear, from a tree on the lawn, a little distant, a continuous calling song, full of sweet importunity, mingled with sadness. It is the call for its absent mate. Sometimes it rolls and gurgles for but a moment, when a shadow flits through the air, and a sudden flash of leaves, the song stops, two birds glide out upon the sky, and fly to their home. But at other times the bird's grief is your gain. No coming mate shortens his song. Some remorseless boy has brought him down, to sing, and build, and brood no more; some cat or hawk or gazing snake has dined upon the fair thing. And so, though the twilight falls, and the evening grows darker, the song calls on, pausing only to change the manner, throwing in here and there coaxing notes and staccato exclamations of impatience, but going back soon to the gushing, pining, yearning home call. Take all my strawberries, O singer! Come to-morrow for my cherries! You pay me in one single song for all that you can eat in a summer! and leave me still in your debt! For there is no such thing as *paying* for that which touches your heart, raises your imagination, wings your fancy, and carries you up, by inspired thoughts, above the level of selfish life. The heart only can pay the heart for good service! As to cherries, I'll take my chance when my betters are served. Eat what you wish, sweet sir, and if there are any left, I will think them all the sweeter, as a part of your banquet.

All the cherries on earth could not be so sweet in the mouth as are the notes of robins in our ears. These drops of sound are the true fruits, and the wide air is that garden of universal fruits which rears and shakes them down for all those whose senses are refined enough to know how to feed by the eye and the ear, more than by the mouth!

From the Bedford Sentinel.

Fowls—How to Make them Lay.

First, take all the hens and have them washed of the vermin with soft soap and warm water, and let this be done on a warm day. At 5 o'clock have them all put in the hen-house for safe keeping. If they remain out, they are liable to cold, which will prevent their laying at the start. The washing must be done properly, as if any vermin are left, they will look drooping, and cease to lay. Good health is the most essential thing to make hens lay. Feed yellow corn regularly every day, at a regular time. Give no animal food of any kind, as this gluts the gizzard, and prevents the grinding of corn. It makes the fowl sleepy and feverish all the time that the gizzard is checked in grinding. Fowls are grain-eating birds, and their nature is for grain alone. To keep them healthy is the great secret of making hens lay. Who ever heard of a sick hen laying? Wheat is too heating for them; buckwheat is very good mixed with corn, but not alone. The corn must be of the best kind. Persons generally feed their fowls on old damaged grain. They cannot keep in health on that which is not wholesome; they must eat what you give them if they cannot get better, and then their owner blames the poor hen for not laying.

Your hens will never lay much on this kind of management. I have kept hens laying ten months by this process, and in winter have lots of eggs. They want the greatest attention. Give them the same attention as you do your horses, and they will soon know their keeper.

Never put straw in the nests, as this is one of the things which causes vermin. Make your nests on boxes out of cedar, and put the boxes full of tobacco stems, and then you will have it vermin-proof. The hens now washed clean, and the tobacco stems, the cedar nest and a new house, you can depend on your eggs. Health and cleanliness are all that you want. Now you may ask what are the best breeds for this purpose—Black Spanish cocks and pure Shanghai hens will be first-rate stock for winter; Black Spanish cocks and Black Poland hens for summer. But these fowls must be the genuine breeds or they wont do. You must be careful to procure the fowls in the best of health, for if you should introduce one of bad health, your trouble will commence and all success is ended. One sick fowl will prevent all the rest from laying, as in a short time they will all, more or less, be affected with this malady. Clean cold water and gravel should be placed in front of the house—water from a spring is best. See that the water is put in an iron vessel, as this will improve the fowl more than any other kind. Lead or zinc cankers, and stone or earthenware gets too dirty. When a hen wants to set, take her away, put her by herself in another yard for a day or two, give her a teaspoonful of castor oil, and in a day or two from this put her back. Every three months change your cocks, if you keep two kinds, and then eggs will be plenty. Six hens for one cock is my rule. I keep two kinds with two yards, and find that it is the best plan that I have yet discovered during all my experience of seventeen years in raising domestic poultry.

The fowls treated in this way will lay two eggs in three days, and continue to do so upwards of ten months. After having laid from twenty-five to thirty eggs, the hen prepares for the tedious process of incubation; then you must give her oil. In the more northerly climates, as Greenland and Siberia, the fowl does not breed. This shows that the climate is one of the principles on which the production of eggs depends. As has happened to other animals that have undergone a long domestication, their varieties have been greatly multiplied, and their native abodes are not ascertained with precision, but they are seldom found in a wild state, except in the warmer regions of the globe, particularly in the forests of Southern Asia, where they subsist on worms and insects, but principally on seeds and grain.

J. J. Bower.

From the Southern Field and Fireside.

Pear Culture in the South.

An Essay, written at the request of the Aiken Vine Growing Association, of South Carolina, and read before that body on Thursday, July 7th, 1859, *by* L. E. Berckmans, *of Augusta, Ga.*

Mr. Chairman:

By resolution of the Society, communication of which has been sent to me, June 16th, you have appointed me to prepare an "Essay on the Culture of the Pear."

The duty conferred upon me by said resolution should be more thankfully accepted if I felt myself better qualified to carry out the views of the Society. However, I hope to be able to throw some light upon the subject, by the result of over thirty years' experience in fruit culture, on this and the other side of the Atlantic, and by my almost exclusive attention to the pear cultivation in the South during the past two years.

The object of the Society in calling up the subject of the Pear culture is undoubtedly, to discuss thoroughly the advantages, inconveniences, profits, and drawbacks of the cultivation of that class of fruit, in reference to its value as a market produce, and as a reliable crop among the different fruit crops.

In taking this view of the subject, our first duty must be to divest ourselves of all prejudice in discussing matters of public interest; and as the production of such an important class of fruits as the Pear is at the eve of assuming large proportions, I cannot but highly approve the opportunity of putting the question before the public, under sanction of your authority, with a view to open the field to impartial discussion and better information.

The culture of every comparatively new, or not sufficiently tested fruit, or cereal, destined to occupy a prominent place upon our markets, and to exercise a marked influence upon the general diet of the people, is well worth the earnest consideration of the Agricultural and Horticultural Societies of the Union. It is, in case of success, a benefit conferred upon the community; and, in case of failure, heavy losses of time prevented and money saved; for individual prejudices and hobbies, not to say anything about less worthy motives, are hard to be overcome; and were it not for such unique and far-famed institutions as the American Agricultural and Pomological Societies, the now almost cleared field of pomology should be a wilderness of confused notions, inaccurate informations; and, worse than all that, of bitter personalities and disputations, where light and impartiality could hardly be expected to find their way.

Much as the Pomological Society has done for the selection and promotion of good fruits, we cannot expect to find among the documents sufficient information in regard to the South, where, indeed, the cultivation of the Pear is still in its infancy. Even in the North it is, and will be for some time to come, a much controverted subject—the result of which has been a general uneasiness, misgiving, and doubt, in regard to the probability of raising large crops of Pears; and, considering so many should have to be discussed, so many objections to be overcome, our task becomes more difficult, and our wish to be brief and concise must yield to the necessity of conveying all possible information.

To proceed in a regular and logical order, we have to indicate the principal points to be discussed in due succession, and in regard to their respective importance.

1. The first question to be examined seems to be: Is the Pear Tree, as a standard or as a dwarf, suited to the South as far as Florida and Louisiana?

2. The second is: Can it be cultivated with profit to a certain extent?

3. Third: Is it durable, and not more exposed to diseases than other products?

4. Fourth: Can we expect to sell the crops with prospects of regular profits? Then what varieties and seasons are to be selected for the market?

5. What soils and aspects, local conditions, manures, and treatment are the best to insure a successful cultivation of the pear?

If I am not mistaken, these must be the main points to be examined in making up an essay—not a treatise. Around these main questions other remarks will occasionally find place.

It must be well understood that the Pear tree is, all things considered, of a more refined, and consequently of a more delicate and weak constitution than the Apple, Peach, and Cherry—the improved Pear tree of our modern times is so far removed from the original wild parent, found in the forests of the old continent, as to be altogether a different thing, and hardly bearing any likeness to that original wild type. Long since have I supposed that this may be the cause of its weaker and more refined habits; for, we all know that the more we make plants and trees recede from their original type, the more they become delicate and subject to various diseases. This law of nature is universal, and in accordance to it, the more refined the fruit, the flower, or the foliage, the more delicate will be the plant. This rule admits of but few exceptions.

But let the cause be what it may, it is a generally acknowledged fact, that the Pear tree is more fastidious, less hardy, and requires a better management than most other fruit trees. It succeeds, however, where almost any fruit tree of the temperate zone does succeed, and it seems rather to be suited to a more Southern latitude than the Northern States. More Pear trees are killed by the mediate or immediate effects of the severe frosts of the North than by any other cause acting farther South. The blight, almost the only fatal disease inherent to the Pear tree, is not worse here than in any other part of the Union, whilst the ravages of intensely cold winters are never witnessed here.

That the Pear tree seems to feel better at home this side of Mason and Dixon's line, is proved to me by three facts which I have closely observed during the last three years. The first remark is, that weak and outworn varieties, only fitted for *Espaliers*, in their native climate, and but ill adapted to the severe winters of the North, are in fine condition here in Georgia.

The other fact is, that some European varieties, although very new or of recent origin, will not do in the North, while they recover all their native strength and beauty here.

The third remark applies to the size and quality of the fruit which, in most all cases, is superior in the South to what I have ever witnessed it to be in other parts. My seedlings show their propensities or characters sooner; their maturity is promoted in less time; their foliage is often double the size of what I found it to be in the North, especially many of the inedited but most prominent seedlings of Van Mons and Dr. Brinkle.

In regard to the Southern limits to be assigned to the Pear, I have not heard of a climate where it did not grow. I had occasion to unpack and to plant the Pear trees sent to our worthy Pomologist, Dr. Brinckle, in Philadelphia, as varieties from Brazil, Peru, and Mexico; they were esteemed there as fine fruits, but they only proved to be inferior varieties of the old catalogues when growing here. This is another conclusive fact in regard to the adaptedness of the Pear to the very lowest latitude, as the same result took place in that instance, to wit: the improvement of an inferior sort to a fruit of good quality. To quote a few facts, I will state that the Bartlett is decidedly better here than in New York or Pennsylvania: that the White Doyenne is more hardy, more certain, and rather too rich; the Flemish beauty, the Pratt, the Buffum, the Van Assche, are larger and better here than in the North. So with most all the Pears I had occasion to test in Georgia and South Carolina, except the old Winter Pears.

Varieties of doubtful quality in the North, as the Parfum Aout, Fondante de Semtembre, Bellissimo D'Ete, Belle de Bruxelles, which I found to be of uncertain or of second quality in Boston, New York and New Jersey, are almost of first quality in my grounds in Georgia. So much for the influence of a Southern temperature upon the Pear. And, as for the so much dreaded action of the Southern sun upon the bark, let me remark that I found it not to be so prejudicial as it is commonly thought to be. I have planted all sorts of trees, and some with highly denuded bodies; I have not found any of them to suffer from that cause. The only pernicious effects in such cases is owing to the rash process of suddenly removing the protecting limbs from a fruit tree, when the body has not been exposed and inured, from its early youth, to the Southwestern rays of the sun.

That the Pear Tree will and must succeed upon the quince stock, I have most satisfactory and convincing proofs—provided the quince stock be not exposed to the air and sun. As a tree is not so weak—it is then complete in its organism; but checked and deprived in its organic structure, it becomes feeble and liable to diseases. When the quince stock, below the bud, is destroyed by worms, it is owing to the following causes:

1. Unfitness of the budding variety to grow well upon the quince stock. (We have many of these.)

2. Exposure of stock, or too deep planting.

3. Excess of moisture, of want of proper food in the soil.

4. The vicinity or presence of old decayed wood, roots, or sticks, carelessly dug in with the tree when planted.

In all these cases it is sickness, either inherent or accidental. Once *fairly* started, there is no more danger for the dwarfed tree.

And now we must examine the much controverted subject: Can the Pear be grown with profit?

This is rather a complicated question, and I do not know how to answer as briefly as I should wish to do. As far as my personal conviction is concerned, I have no hesitation in replying in the affirmative, provided we stick to the following rules:

1. The selection of a proper soil. All soils are not suited to the Pear tree.

2. A locality sufficiently free from excessive moisture, and rather rolling them too level and flat.

3. The judicious and careful selection of hardy, handsome, productive and good varieties, selling not only as good, but also as fair and inviting fruit.

4. The selection of stock. Some Pears, if not all, growing upon the quince, are better upon that stock than upon the free or wild Pear stock. No Pears are nor were ever good upon the Hawthorne, Amelanchier, Mountain Ash, &c. We have tried that twenty years ago, and never succeeded in producing any good fruit, although we made trees grow finely for the first two or three years.

5. The proper attention and care bestowed to the tree, which must be more than that given to the apple, peach or plum. Next to the grape, the Pear requires the greatest attention and skill. It is not everybody's business to raise handsome fruit, and to *form* trees which, in a season of abundance, will have their fruit so equally set and distributed all over the trees as not to split and break the limbs, as is often the case.

Let us remark that the greatest care is only needed when the tree is very young. After it is once well-shaped and sets to bearing, it sends out less rank wood and takes better form and habits.

It would take more words than I can compress in an essay to lay down the rules of judicious pruning, without which there is no future for the Pear tree, at least in most cases, and among the most refined sorts. We must confine ourselves to a few remarks upon the profits and the choice of varieties suited to the market.

In the vicinity of Boston, for instance, most handsome profits are realized from the Pear crops. Although, judging from the quantity of Pears growing around that city, we should deem the market to be overstocked; still, Pears sell in Boston from 50 cents to over $4 a dozen. Some cities, as Philadelphia, have only a few inferior Pears in the market, and would pay any price if they could get these in some quantity. Two years ago the editor of the *Horticulturist* wrote me: "Much is written about Pears, but we cannot buy any in our Philadelphia market—please let me have some, for love, for begging, or for money!" In fact, the Pear is considered such an aristocratic fruit, (if I may use that term,) that those who grow them keep them for their own families, friends, and visitors, as one of the finest luxuries. I have seen as much as $6 paid for a dozen of handsome Pears in Boston, (in December.) No party is fashionable among amateurs without at least one fine dish of Pears. Messrs. Hovey, Austin, and many others, sell Pears in large quantities, with very handsome returns. From New Jersey, Western and North-western New York, large quantities are sent to New York city. Col. John Hebron, in Mississippi, makes his Pear trees pay, and over.

And when we consider that Pears, *to be good*, must be picked a few days before ripe, it seems just the article for transportation to distant markets. I have no doubt I can pick fine full grown Bartletts, pack them in barrels, send them to New York, or Quebec, or Havana, and when they will be at the port of destination, and leisurely unpacked, they will just be in the very best condition to go to the market or to the table. In regard to the facility and security for, and the very improvement of the fruit *by* transportation, no other fruit can compare with the Pear, not even Oranges and Lemons—the Pear and some Apples being the only fruit which *requires* picking from six to eight days before maturing, to bring it up to its true quality. To make a Pear orchard pay, we need only the necessary skill and care, a well cultivated soil, and a climate where the bud is not exposed to be killed by 20 degrees below 0, or by the uncertain springs of the North. We have not to care about markets—for such fruit they are everywhere, because it bears, and rather demands transportation.

Let those who have the means, time, skill, and a little patience, try the experiment. They will find out that a well-planted and well-directed Pear tree comes into bearing sooner than an Apple, and almost as soon as a Peach tree; that in this climate the crops are more regular and certain; that the Pear tree can be considered as an annual bearer, while Apples are not, and Peaches are very uncertain. The season of blossoming for the hundreds of varieties of Pears is so protracted, that only a score out of a hundred will be in blossom when a spring frost sets in, and the others will either have set their fruit, or be dormant, and consequently out of danger, with an ordinary slight spring frost. I have reasons to consider the blossoms of a Pear tree more hardy than that of a Peach or Apricot. Few worms attack the Pear—the rot, the ordium, and the curculio, are strangers to it.

But is a Pear tree lasting? I have seen many a Pear tree over a century old; and, with proper care and management, it will last as long as any other fruit tree. As I stated before, the diseases are mostly confined to the blight, which affects some varieties more than others—the old varieties more than the new ones. We can, in the actual state of science, not even indicate a remedy, but we cannot ascertain the origin and cause (or causes) which produce that troublesome disease. All I have been able to do is, to direct my attention and studies to the wood, foliage, and general characters, which seem to render a given variety more liable to the disease. The class of Bartlett foliage and bark seems to be the most exposed, as I remark in the very seedlings bearing those characters. So is the Glout Moreau and the Vicar—notwithstanding that the bark and foliage are very distinct in the three varieties. To prevent the disease in old trees is impossible—for young trees there is a better chance—close watching and pruning, the prompt removal of the diseased wood, longitudinal incisions when the appearance of the bark is not sound, a good supply of special *wood forming* manures, are the best means, if not to prevent the blight altogether, at least to stop its further progress, and in most cases the tree can be saved.

We have, it is true, a diminutive borer, which sets in just above a bud or a spur, and working down a few inches, circles or girdles the wood from inside out, and destroys part of a limb in growing, or the body in very small trees. But this insect is scarce, and only injures part of the wood or unsound trees. I found it most active in some shrubs, as the Spireas, Deutsias, Seryngcs, and chiefly in the Lagerstromia. Among thousands of young Pear trees in my grounds perhaps not fifty have suffered from that insect, and those were only partly injured. The blight will be found the worst in rich bottom soils, where the tree takes up too much ammonia instead of the proper constituents of the wood and organs of the tree—those are ashes, lime, phosphate, iron, silicates, plaster or gypsum. These substances, with the carbon of the atmosphere, form the proper basis and food of all the trees. Ammonia and nitrogen, promoting a too luxuriant growth and porosity of the bark, seem also to promote the blight. I have been told by Mr. Downing that seasons have been witnessed at the North when at least every tenth Pear tree was destroyed or injured by the blight. Still, Pear growers have not been discouraged; and, indeed, it never has proved a disease as fatal and destructive as the borers, the yellows, the black knot, and the ravages of the curculio, from which the Pear tree is altogether free. Thousands of Apple, Peach, and Plum trees are destroyed by these evil causes, and their crops very uncertain if not complete failures. This tells much in favour of the Pear tree.

The best season to bring Pears into the market would seem to be from the months of September to December, (Winter Pears being better suited for amateurs, as requiring too much watching and extra care;) then, the Peach is scarce, the Plum and Figs are gone, and the Winter Apple has not yet taken its place in the market. This remark applies to our home markets. For the markets of the North the very earliest Pears are the best.

I have partly answered the question of soils and localities. I shall only add, that deep sandy loam soils, rather dark than light coloured, Western, Eastern, and Northern aspects, and rather elevated localities, seem to be the best for the health of the tree and the setting of the blossom; and that Southern latitudes agree better with the Pear than higher latitudes, where often winters from twenty to thirty degrees below zero prevent all reliance upon a fair crop of refined fruits, su.h as Pears, Peaches, and Grapes.

I shall not see the time when the South, from Virginia to Alabama, shall be considered the fruit garden of America, but I am fully convinced that such a time must and shall come, and that thousands of acres, unfit for cultivation of cotton or rice, will be converted into remunerative orchards.

All we want is a little patience—a rare thing with a *fast* people. We must consider that fruit trees are different from sweet potatoes, although they do not require more, if as much care, and that the planting of rows of fruit trees in the field, at convenient distances, will not materially interfere with the crops of potatoes, cow peas, or vegetables, or any low growing crops that will not smother the young trees. If, moreover, we will consider that soils exhausted for ordinary crops still do retain a great deal of the constituents required for a tree, it will be evident that fruit can often be obtained where other products must fail.

We have yet to find out what sort of Pears are best suited to our Southern latitude. Every season, almost, brings us new Peaches, Grapes, Pears, and Apples, superior to the old varieties, which will slowly work their way to the head of the list of prominent fruits. Among the native and foreign varieties, many have been found to be well adapted to our climate. We have a great deal more in expectation, and among my select seedlings, collected from this and distant countries, many give fair promise of being ranked, at some future day, among our best and certainly our most hardy and vigorous varieties.

Permit me to conclude this already too long chapter on Pears with some remarks upon the different opinions about this fruit.

The mistakes and deceptions which have so often occurred, and have discouraged many zealous amateurs, are mostly the result of unwise selections of the worn out varieties, discarded and given up in their native localities and here, not as refuse and unsaleable stock but under good sounding, or false names, and which must have proven, as they did prove, indeed, failures. The newly obtained varieties are undoubtedly (and with some few exceptions,) the most vigorous, symmetrical, and hardy. Of all the Pears cultivated at present as leading varieties, a few only can be traced as far back as Duhamel, or even Poiteau, (editions from 1785 to 1810.) The Duchess, the Beurre Superfin, the Beurre d'Anjou, the Belle Lucrative, the Clairgeau, and many others of our best leading sorts, were not known twenty-five years ago. I have hundreds of seedlings, selected from among thousands, with which I would not part for any consideration, so sure do I feel that some day they must take the place of such varieties as I do not consider as perfectly adapted to our latitude, or to our wants. We must have hardy, beautiful, vigorous, productive trees, easily cultivated in all soils, and more easily kept in the right form and shape, with good or best and large fruit. What the last twenty or thirty years of experiments, or good chances, have done in that way, will be compared to what is at present going on in our great Union. Seedlings are brought to notice every season from Maine to Alabama.

It has been my good fortune to be connected with many influential and well-informed gentlemen, and thus to have got a chance to test most all the novelties here in the South, at the same time that they are submitted to the judgment of amateurs in other parts of the Union. Let us not judge the *Cultivation of the Pear* by the worthless varieties which have induced people to say Pears will not do in —— (no matter what State,) it was the same in all States. When I first became acquainted in New Jersey, I was told "Pears would not do well just there," and now Professor Mapes, Doctor Ward, William Reid, and many others, realize handsome profits, and have fine, almost certain crops every year. And why? Because they wisely discarded the old, sickly, and run out varieties of the catalogues, when Pear culture was in its infancy, and took to the new sorts endowed with all the vigor, beauty, and fertility of renovated products.

I have thus far spoken of the Pear tree as a producer, in competition with the other fruit producing trees of our latitude; but if we come from the orchard to the garden, we will find the Pear tree the most indispensable, ornamental, and convenient tree to be placed around dwellings and among our flowers and shrubbery. What is equal in beauty to a well managed and sound Bartlett, Superfine, Michel Archangel, Buffum or Urbaniste?

But we must conclude, and we will do so with a wish that more effectual and persevering efforts should be directed to that branch of rural economy. In a climate and with such a soil as ours, we must have the best Pears, as we have already the best Peaches and Grapes, to say nothing of our delicious Apples. We have the choice of localities, plenty of room, and the means to try experiments. We shall not remain behind when all the North, much less favored by nature and climate, is fully alive to the importance of this question.—*Southern Field and Fireside.*

Editorial Life---A True Picture.

Did it ever occur to you, most agreeable reader, that editorial life is not an unruffled sea. Did you ever pause in looking over a newspaper to think of the ceaseless toil that is necessary to provide for you the columns and paragraphs you so easily scan? This editorial writing—what a ceaseless tapping of man's brains it is! No matter how he feels—the paper must be out at the appointed time, and his usual contributions must fill the accustomed niche.

The limited space of a newspaper column does not allow the editor to treat any subject at large. He must not attempt an extended discussion, no matter what he writes about; but he is expected to touch on a variety of themes every week, and to just touch them—nothing more; so that his readers may not be wearied by long articles. To write a long essay or series, would sometimes be a great relief. But if he does either, ten chances to one he will hear of it. Once or twice, in a long editorial service, we have ventured to do this dangerous thing. Fortunately we heard no complaints, though we have no doubt many were uttered. Now and then, however, we have been complimented by a brother saying to us: "That was a very good article in last week's paper, as far as I read; but it was so long, I was called off before I had time to finish it!"

Editorial writing is pleasant enough and easy enough to a man accustomed to it—when he has once determined what he shall write. But this selection of topics is not easy. For a single paper or two, any man will find subjects at hand; but when it comes to writing to the same readers year in and year out—when one calls up the subjects already presented, some briefly, others more elaborately, either by himself or by correspondents, the difficulty of selecting so as to avoid self-repetition, is quite embarrassing. As to waiting till something suggests itself—till it comes to you—that is out of the question. The respectable but ill-named boy is at your door already. He is calling for copy. You must sit down and write at once. What if half a dozen persons in the office are earnestly discussing Church matters or politics? What if you are interrupted every moment by some irrelevant interrogatory, urged with singular indication of obliviousness of what you are about? You must hold on to the thread of an idea, it you happen to have one, and still do the agreeable to your friend; you must write with some appearance of understanding what you are saying, whether, in reality, you know what you are about or not; you must feel your way through, like a man walking in a narrow pass during a dark night; and, having reached the end of your sheet, you may take a long breath, and turn away in search after some other subject. And there is no end to this, for as soon as you have succeeded in arranging for one number, the burden of another is upon you from the first of the week in January till the last in December.

But to the writing of editorial is to be added the aggregate of other duties. Here is a correspondence well meant and full of sensible sayings. But is badly written, perhaps badly spelled, perhaps poorly put together. You must go over it. You must dash out an unnecessary word here and put an omitted word yonder. You must be a grammarian for the writer, who either has never learned grammar, or has permitted himself to write without revision; you must, in short, prepare his irregular composition for the press, and where you cannot make out precisely what he intended to write, guess at it, and let your readers have the benefit of your guessing.

To read a newspaper for pastime is a very inviting employment. But here are twenty received by the morning's mail. You take the scissors in hand and glance over them. What a treat would these be to some people—people who have leisure to read them through. But your work is scissorise. You are looking for scraps. Here is one, but you had it in your paper last week. Here is another, but it is too sectarian. Here is a third, but it is one of last year's creation that has lodged awhile on the shores of forgetfulness, and is now swept again on the tide of news to float until it can find another standing place. After another hour or two of search you gather the result. It is your column of clipping from the exchanges. What a search for so meagre a reward.

Well, have you done? See, there is a roll of proofs. The type is set, and the foreman wishes to make up the form. Here is a letter up side down—there is a word you never saw before—here is a sentence without a meaning. What are you to do? Look at every letter—read every intended correction, and send it back to be printed after your alterations shall have been made. You must do this at once. Delays are dangerous. You must not take half a day for it. Drop everything you have before you, and read your proofs. The press will be waiting for you, and unless you are in time, your place will be taken by another, and your issue delayed. Happy the editor who, when his sheet is out, does not find a dozen errors that he could not find before. Thrice happy he, who, besides all this, does not find many that he did not see still glaring upon him in all their ugly deformity and provoking calmness, despite of all his care.

Balt. U. S. Journal.

The Crow.

[The following article on the habits and natural history of this sagacious bird is copied from the *Atlantic Monthly*, which is, by the way, the finest magazine in the United States. Familiar as the Crow is to all our readers, yet the article cannot be perused without exciting fresh admiration of his qualities.—EDS. FARMERS JOURNAL.]

The Crow may be considered the representative, in America, of the European Rook, which he resembles in many of his habits, performing similar services, and being guilty of the same mischievous deeds. It is remarkable that in Europe, where land is more valuable than in this country, and where agriculture is carried on with an amount of skill and nicety that would astonish an American farmer, the people are not so jealous of the birds. In Great Britain rookeries are regular establishments, and the Rooks, notwithstanding the mischief they do, are protected, on account of their services to agriculture The farmers of Europe, having learned by repeated observation, that, without the aid of mischievous birds, the work of the farmer would be sacrificed to the more destructive insect-race, forgive them their trespasses, as we forgive the trespasses of cats and dogs. The respect shown to birds by any people seems to bear a certain ratio to the antiquity of the nation. Hence the sacredness with which they are regarded in Japan, where the population is so dense that the inhabitants would feel that they could ill afford to divide the produce of their fields with the birds, unless they were convinced of their usefulness.

The Crow is one of the most unfortunate of the feathered tribe in his relations to man; for by almost all nations he is regarded with hatred, and every man's hand is against him. He is protected neither by custom nor superstition; the sentimentalist cares nothing for him as an object of poetical regard, and the utilitarian is blind to his services as a scavenger. The farmer considers him as the very ringleader of mischief, and uses all means he can invent for his destruction; the friend of the singing-birds bears him a grudge as the destroyer of their eggs and young; and even the moralist is disposed to condemn him for his cunning and dissimulation.

Hence he is everywhere hated and persecuted, and the expedients used for his destruction are numerous and revolting to the sensibilities. He is outlawed by acts of Parliament and other legislative bodies; he is hunted with the gun; he is caught in crow-nests; he is hoodwinked with bits of paper smeared with bird-lime, in which he is caught by means of a bait; he is poisoned with grain steeped in hellebore and strychnine; the reeds in which he roosts are treacherously set on fire; he is pinioned by his wings, on his back, and is made to grapple his sympathizing companions who come to his rescue; like an infidel, he is not allowed the benefit of truth to save his reputation; and children, after receiving lessons of humanity, are taught to regard the Crow as an unworthy subject when they carry their precepts into practice. Every government has set a price upon his head, and every people holds him up to public execration.

As an apology for these atrocities, might be enumerated a long catalogue of misdemeanors of which he is guilty. He pillages the cornfield, and pulls up the young shoots of maize to obtain the kernels attached to their roots; he destroys the eggs and the young of innocent birds which we should like to preserve; he purloins fruit from the garden and orchard, and carries off young ducks and chickens from the farmyard. Besides his mischievous propensities and his habits of thieving, he is accused of cunning, and of a depraved disposition. He who would plead for the Crow will not deny the general truth of these accusations, but, on the other hand, would enumerate certain special benefits which he confers upon man.

In the catalogue of the services of this bird we find many details which should lead us to pause before we consent to his destruction. He consumes, in the course of the year, vast quantities of grubs, worms, and noxious vermin; he is a valuable scavenger, and clears the land of offensive masses of decaying animal substances; he hunts the grass-fields, and pulls out and devours the underground caterpillars, wherever he perceives the signs of their operations, as evinced by the wilted stalks; he destroys mice, young rats, lizards, and the smaller serpents; lastly, he is a volunteer sentinel about the farm, and drives the Hawk from its inclosures, thus preventing greater mischief than that of which he himself is guilty. It is chiefly during seed-time and harvest that the depredations of the Crow are committed; during the remainder of the year we witness only his services; and so highly are these services appreciated by those who have written of birds, that I cannot name an ornithologist who does not plead in his behalf.

Let us turn our attention, for a moment, to his moral qualities. In vain is he accused of cunning, when without this quality he could not live. His wariness is really a virtue, and, under the circumstances in which he is placed, it is his principal means of self-preservation. He has no moral principles, no creed, to which he is under obligations to offer himself as a martyr. His cunning is his armor; and I am persuaded that the persecutions to which he has always been subjected have caused the development of an amount of intelligence that elevates him many degrees above the majority of the feathered race.

There are few birds that equal the Crow in sagacity. He observes many things that would seem to require the faculties of a rational being. He judges with accuracy, from the deportment of the person approaching him, if he is prepared to do him an injury; and seems to pay no regard to one who is strolling the fields in search of flowers or for recreation. On such occasions, one may get so near him as to observe his manners, and even to note the varying shades of his plumage. But in vain does the sportsman endeavor to approach him. So sure is he to fly at the right moment for his safety, that one might suppose he could measure the distance of gunshot.

The voice of the Crow is like no other sound uttered by the feathered race; it is harsh and unmelodious, and though he is capable, when domesticated, of imitating human speech, he cannot sing. But Æsop mistook the character of this bird when he represented him as the dupe of the fox, who gained the bit of cheese he carried in his mouth by inducing him to exhibit his musical powers. The Crow could not be fooled by any such appeals to his vanity.

The Crow is commonly regarded as a homely bird; yet he is not without beauty. His coat of glossy black with violet reflections, his dark eyes and sagacious expression of countenance, his stately and graceful gait, and his steady and equable flight, combine to give him a proud and dignified appearance. The Crow and the Raven have always been celebrated for their gravity—a character that seems to be the result of their black sacerdotal vesture, and of certain manifestations of intelligence in their way and general deportment. Indeed, any one who should watch the motions of the Crow for the space of five minutes, either when he is stalking alone in the field, or when he is careering with his fellows around some tall tree in the forest, would acknowledge that he deserves to be called a grave bird.

Setting aside the services rendered by the Crow to agriculture, I esteem him for certain qualities which are agreeably associated with the charms of Nature. It is not the singing-birds alone that contribute by their voices to gladden the husbandman and cheer the solitary traveler. The crowing of the Cock at the break of day is as joyful a sound, though not so musical, as the voice of the Robin who chants his lays at the same early hour. To me the cawing of the Crow is cheering and delightful, and it is heard long before the majority of birds have left their perch. If not one of the melodies of morn, it is one of the most notable sounds that herald its approach. And how intimately is the voice of this bird associated with the sunshine of calm winter-days—with our woodland excursions during this inclement season—with the stroke of the woodman's axe—with open doors in bright and pleasant weather, when the eaves are dripping with the melting snow—and with all those cheerful sounds that enliven the groves during that period when every object is valuable that relieves the silence or softens the dreary aspect of Nature!

From the Southern Cultivator.

Improved Land and Increased Value.

We would call especial attention to the following letter from Hon. B. P. Johnson, the able Secretary of the N. York State Agricultural Society. It is of peculiar significance and value at the present time, when the subject of improving our lands is beginning to receive the earnest attention of our people:

Editors Southern Cultivator—I received yours of the 27th ult., in due time, and, perhaps, I cannot better answer your inquiries, as to the improvement made by farmers here and the increased value of lands from improvements made, than by giving you the statements of some individuals which have come before our Society, and are entirely reliable.

A farm, situate in this county, which, for fifty years, had been under a system of destructive cultivation, taking everything off and returning nothing to sustain the land, came into the possession of a farmer in 1845. The land was so exhausted that, for the first two years, little could be raised; but, by a judicious system of manuring, rotation of crops, &c., this farm, consisting of 185½ acres, gave a gross income of $4,852, and a net income, after deducting expenses of cultivation, of $2,678 16, in 1851—six years from the time it was entered upon.

The method of improving this land (a sandy loam soil) was by plowing under green clover—plowing at least 8 inches deep—applying manure generally as a top dressing (twenty to thirty loads per acre) to grain crops. The manure, mainly made from the droppings of cattle and horses kept on the farm, averaging about 300 loads (of 30 bushels) per year. Lime and plaster, used plentifully—stable manure and lime considered the best manure for this land. The increased fertility of this land was secured by judicious culture.

To show you what was the condition of the land when the farmer took possession of it, I give the statement of the former occupant:

"I occupied the farm 16 years previous to your purchase: the farm was all the time in market; I was a tenant at will, and had no incentive to improvement, so that the farm rather deteriorated under my management. *I farmed it with a view of getting the most out of it at the least possible expense.* I paid one hundred dollars a year rent; some of the land was new when I went upon it and it paid me very well, but for the last few years the land was so worn down that I no longer considered it an object at the price I paid. With regard to the amount of sales of produce, I should think I must have sold about 400 dollars worth yearly. I do not think I left *the farm any better off* than when I *came* upon it 16 years before. I did not suppose the *farm was capable of doing what I see you have made it do.*"

It will be seen that the reason this man did not accomplish anything was, that *he had no inducement*, as he thought to farm well *because* the landlord would have the benefit of the increase as well as himself, and so he labored for his board and lodging for 16 years—the best part of his life. There are multitudes of such men who are owners of land and pursue the same depleting system this man did, and *then say farming don't pay.* '*Tis true*, and always will be, *that such farming will never pay*—it is but using land as if it was a plaything, and after a little time may be thrown away. It is proper to say, that this farm was advantageously situated as to market; but that *was as good* for the tenant, during his 16 years, as the *owner after him.* It does not militate against the *certain success* of the farmer by his pursuit, if he will avail himself of the means adapted to secure the result. Evidences are abundant that the fertility of the land cannot only be maintained, but increased in richness; and there is no necessity of having this exhausting process continually going on.

Another case in the interior of the State—a farm redeemed from the forest. In 1839 the farmer commenced his operations in the wilderness—land purchased, probably, at not more than $5 per acre. The forest had to be removed and the land brought under culture, which was a work of *time.* A plan of gradual improvement was adopted in clearing the land and preparing the soil, which has resulted in success. The hard crust underlying the native soil was attacked year after year by plowing deeper each season, bringing it up to the influence of air and water, forming a deeper and more valuable soil. While crops, formerly of wheat, averaged 10 or 12 bushels; corn 20 to 25 bushels; now wheat (before the insect appeared) averaged 20 to 25 bushels, and corn full 60 bushels; and an equal advance in meadows—and this all accomplished by the labor of the farmer and his judicious management.

In January, 1857, this farm, of 60 acres, of which 20 acres are in woodland and five acres in buildings, highways, &c., leaving only 35 acres under culture, gives the following result:

Value of the stock, implements, &c., on hand, $1,065; value of grain and other products sold, $1,210; leaving, after all the expenses of the farm and family had been provided for, $468 to the credit of this little farm.

During the period of its occupancy, and since the forest has been felled, it has been paid for, thoroughly drained, good and sufficient stone and other fences erected, weeds eradicated, neat and commodious buildings erected which are most attractive. And here the value of this land from its nominal price in 1839 (when it was bought) has been brought to its present condition by a careful and judicious management, ever keeping in view that it must, each year, be increased in its value for cropping—judicious rotation of crops so that no one crop should exhaust and run out the land.

This farm is now worth $40 to $60 per acre.

I could multiply these evidences, especially in our dairy districts, were it necessary. The system of *scourging the land* and exhausting its life blood and then abandoning it for little, and fleeing to the cheap lands at the West, there to repeat the same course of exhaustion, is being arrested, and the management of farm land is greatly improving and the occupation of the farm is giving as much real and substantial comfort and independence as any other pursuit. And it will continue to be more and more successful, as more skill and intelligence are enlisted in this pursuit.

I regret I could not answer your letter more fully and at an earlier day; but a pressure of engagements is the only reason. I shall be pleased to answer any inquiries that you may desire, as far as I can. I desire to do all the good I can to the great agricultural interest of our country—the foundation of our prosperity as a nation, the conservative element in our population, which will be proven in the hour of peril, should it ever come (which may God in his infinite mercy prevent.)

I am most truly yours,

B. P. JOHNSON.

State Agricultural Rooms, Albany, N. Y., May 25th, 1859.

From the Southern Cultivator.

Low Price of Southern Lands---Remedy Etc.

EDITORS SOUTHERN CULTIVATOR:—I am not farming to much extent, and it may, therefore, be thought presumption in me to give my views on the following subject; but after carefully and anxiously reading the article commenced in the May number and concluded in the June number of your valuable journal on "the Cheapness of Lands at the South, its Causes and Remedies," I have determined to trouble you with my thoughts on that subject. If this article has but the effect to excite the minds of those capable of unfolding that subject, I have effected my object. With this spirit I send you this, which, should you think it worthy, give it a place in the *Cultivator*. I admit, with that article, the evils exist, and would gladly see them remedied, but differ as to the causes and remedies.

There are four causes of exhaustion to our soils, and, consequently, of lessening their value, viz:

1st. Our long hot summers.

2nd. Our heavy washing rains of winter.

3rd. The things cultivated.

4th. The mode of cultivation.

The first and second are peculiar to the South. They are the dark side of the picture of our snowy fields and sunny skies. They cannot be removed, but may be greatly warded off. With them the North has little or no trouble. Any one who will carefully observe the effects of one of our long summer drouths on the soil, will, unhesitatingly, say that it injures the soil more than any crop raised by us. By it nearly every liquid and volatile particle is evaporated. So great is this heat that in places it cracks the earth to the depth of twenty feet. In parts of Texas, well-diggers have seen traces of these cracks even deeper than that.

2. *The Washing Rains of Winter.*—The whole South is subject to tropical changes. The rainy season coming in winter. When it sets in, the rain falls in torrents. The earth is never frozen during our winters, but completely softened by these rains. In Texas, when rain sets in, it fills these deep cracks with the top soil, leaving gravelly ridges between, resembling huge potato ridges. When these do not exist, owing to the unfrozen state of the ground, softened by the rains and our method of cultivation, the remaining portions of the soil are mostly washed away.

In the North their summers are short and warming—not burning; and in the winter the earth is mostly frozen, the rain by freezing and the snow, instead of washing, forms a mantle of protection.

3. *The things Cultivated.*—The principal objects are cotton and corn raised from year to year on the same ground without change, unless it be from cotton to corn and from corn to cotton. Annually extracting from the soil the ingredients which compose the food of those plants until the soil is exhausted of them, however plenty in other ingredients, and then thrown away. The author of that article says that "cotton, of

all our crops, is the least exhausting," &c. Cotton, as it has but few lateral roots and is sustained principally by one large tap root, may, of itself, take least from our soil; but its clean culture and continued turning of the fresher soil to the burning sun makes it the most exhausting of all crops. Its clean culture and few lateral roots leaves the soil without anything to hold it together, and in the worst condition possible for our heavy winter rains.

In the North, the principal objects of cultivation are grasses and the cereal grains, the stalks of which shade the ground in summer, and their rootlets form a complete tie to the soil against their thaws of spring. The stubble and stalks which they turn under in the fall after the injurious heat of summer is over, forms a coat of manure which, by rotting, keeps the soil warm and mellow.

4. *Our System of Cultivation*.—As the author of the article truly remarks, "lands in the South are bought with the calculation of being worn out and deserted." The clearing is about one-fourth done. For the first two years no crop is raised from shade and unbroken soil. As soon as trees die and the roots rot, the soil, for want of something to hold it together, from scratching instead of plowing, and that up and down hill, washes in a most frightful manner. Deep and horizontal plowing and hill-side ditching are ridiculed. Manuring is almost wholly neglected except a handful of cotton seed in the hill. A very light and temporary affair. Our plowing averages from two to six inches deep.

In the North, notwithstanding they have none of our winter washing rains, they horizontalize their plowing and efficiently hill-side ditch their lands. Their plowing averages from 5 to 15 inches deep. In addition, they harrow and roll their lands after plowing until the soil is completely pulverized, and smoothed as near as may be. They manure without stint.

REMEDIES.

That author recommends stock and their raising as a remedy, by furnishing manure, &c. Although I am a strong advocate for stock-raising, the idea that stock enriches the soil seems to me merely speculative. True, stock are great collectors of manure, but do not create a particle. The richness scattered over a great extent of country they bring home to their resting places at night, but what they bring there they have taken from their feeding quarter, so that while they enrich their pen they impoverish their pasture. Add to this, more than half their food passes off in insensible perspiration. Of that which remains a great deal passes into bone, blood and flesh, while no inconsiderable amount is consumed in keeping up the wear and tear of the animal system. Of all they eat and drink there remains for manure but the indigestible parts, and the decayed portions of the animal which pass off in the form of dung and urine—perhaps not a tenth.

It seems to me the reason of the thing suggests the following remedies:

1st. Deep horizontal plowing and ditching. This will keep what you have and what you add.

2d. Turning everything into manure which will make it, husbanding it as you do your gold, and scatter it over your field with a liberal hand.

3d. Shade the soil. This cannot be done to better advantage than by sowing, in abundance, grasses, clover and small grain, peas, planting potatoes and fruits of every kind. These will shade the earth in summer and their rootlets act as ties to the soil in winter.

Shade induces gentle showers. These grasses, grains, &c., will extract food and richness from the atmosphere—from the soft showers and pearly dews—and their roots from the decomposing subsoil which deep plowing will enable them to reach. All the parts of the earth unshaded and exposed to the direct and continued rays of the sun have and would become sandy deserts. Let us learn from and imitate Nature.

After raising grasses and small grain, stock-raising becomes of value to a farmer. They change these into pork, milk, butter, cheese and beef, wool and mutton. In a word, they are machines by which he can extract from the bulky and raw material, the prepared and valuable portion; leaving the insoluble parts in the form of manure—bring everything into use at once.

5th. Since we must raise cotton, let it be done amidst a rotation of crops, and as much as can be, on land too level to wash when thrown up in ridges and deprived of rootlets.

6th. Let our farmers raise everything

at home necessary for home consumption, which the soil will, either directly or indirectly, produce, and there are few things which it will not. This will give farmers an opportunity to rotate their crops; enrich instead of wearing out their soil, and save the freight and carriage of the articles back and forth which they buy for home use. They will have less cotton for sale, it is true, but what they do have will be clear cash—not spent in expenses and buying the next year's support. It seems our farmers are in a whirl, "making more cotton to buy more negroes to make more cotton to buy more negroes," &c. They should make land (not negroes) the standard of value; ornament and cherish home as a patriotic and christian virtue; live there—not stay, as at a tavern—and cease this everlasting moving "Westward, ho!"

PUBLIUS.

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[We commend the above article (with those previously published on the same subject, to the especial attention of our readers; and, in this connection, cannot refrain from giving the private note which our friend "PUBLIUS," sends us with his very excellent article. It is as follows:

JUNE 1st, 1859.

Dear Sir:—Enclosed I send you an article, suggested by reading the article commenced in your May and concluded in your June number, on "The Cheapness of Lands at the South—its Causes and the Remedies." A subject fraught with the dearest interest of the South, and one, in my view, which cannot be too much agitated. Should you think the article worthy, give it a place in your valuable journal. It is longer than I should wish, but, owing to the extent of the subject and the many causes and remedies connected with it, I could not express my views in a less space.

I am not farming as a primary pursuit, but was raised on a farm in the South *and love it better now than the strife and chicanery of Court.* You will see by your list that I am a subscriber to the *Cultivator,* and have been for some two years. Everything contained in it, even to the advertisements, is carefully read not only by myself, but by my wife also. No visitor is more welcome.

Very respectfully, H.

The Cotton Crop of the Commercial Year just past, and its Prospects in the Future.

The Cotton crop of the commercial year 1858 and 1859, just closed on the 31st of August, will sum up in round numbers 3,700,000 bales—it may perhaps reach a few thousand over those figures; and the market closing in Mobile at 11 to 12 cents for middling cottons. These figures are encouraging, decidedly so to the cotton planters of the country; they prove beyond a doubt that neither a *four million* crop nor a European war can very materially affect the prices of cotton. Our information, from all sections of the cotton growing region, give us the most flattering accounts of abundant corn crops, which is now safe beyond all the contingency of seasons. The growing cotton crop is good—remarkably so generally; it is now, however, at the critical period of its growth. The worm is in it, and the clouds are lowering and rainy; it is therefore the extreme of folly to attempt any calculat on as to the extent of the cotton crop, until the dry weather, after the equinoctial period. On this subject our experience has been—and few have watched the subject more carefully—that the more flattering the growth of weed at this season the more hazardous the crop.—*Cotton Planter and Soil.*

A Useful Table.

Counting plants one foot apart each way, we shall have forty-three thousand five hundred and sixty upon an acre, because an acre contains that number of superficial feet. Take the figure in the first column of the following table as the distance apart, and an acre will contain the number of plants in the second column:

1½ feet	-	19,360	12 feet	-	302
2 feet	-	10,890	15 feet	-	198
2½ feet	-	6,969	18 feet	-	134
3 feet	-	4,880	20 feet	-	109
3½ feet	-	3,530	23 feet	-	90
4 feet	-	2,722	25 feet	-	69
5 feet	-	1,742	30 feet	-	48
6 feet	-	1,200	35 feet	-	35
8 feet	-	680	40 feet	-	27
10 feet	-	435	45 feet	-	21

Southern Cultivator.

Foreign Trade.

The development which has been given to the foreign trade of the country, since the tariff of 1856 came into operation, may be seen in the following table of the leading exports, the specie movement, the net imports of goods, and the duties collected in each year of the present ad valorem tariff:

UNITED STATES IMPORTS, EXPORTS, AND CUSTOMS' REVENUES.

	Export bread-stuffs & Provisions.	Cotton.	Total of all Domestics.	Specie Import.	Specie Export.	Goods Imported.	Duties Collected.
1845....	16.743.421	51,739,643	98.455.330	4.070,242	8.606.495	105.599.541	27.528,113
1846....	27.701,121	42.767.331	101.718.042	3.777.732	3.905.268	110,048,859	26.712.668
1847....	68,701.921	53,415,848	150,574.844	24.121.289	1,907,739	116.257.595	23.747.864
1848....	37,472,751	61.998.294	130.203.709	6,360.224	15.841,620	140.651.902	31,757,070
1849....	38.155,507	66.396.967	131.710.081	6.651.240	5.408,648	132.565.108	28.346,738
1850...	26.051.371	71.984.616	134,900.233	4.128.792	7.522.964	164.032.033	39.668,686
1851...	21.948,652	112.315.317	178,620,138	5.453.981	29,465,752	207.618,003	49.017.568
1852....	25.857.027	87,965.732	154.930,443	5.503,544	42.674,135	195.072,695	47.339.326
1853....	32,985,322	109,456,404	189.869.162	4.201,382	27.486.875	251.071,358	58.931.865
1854 ...	65,941,323	93.956.229	215.156,304	6.918.184	41.436.456	275,955.893	64.224.190
1855....	38,895,348	88.143.844	192.751.135	3.659.812	56.247.343	231,650.340	53.025,794
1856	77.187.301	128.382.351	310.586.330	4.207.632	45.745.485	295.650.938	64,022.863
1857...	75,069,634	131.575.857	278.906.713	12.461,799	69.136.922	324.452.725	58.879,620
1858..	52,439.089	131.386,661	251.351,133	19.274.496	52.633.147	251.727.008	41,789.619
1859....	30,000,000	165.000,000	225,000,000	4,000,000	60,000,000	225,000,000	49.101,204

It is observable that the import and consumption of goods followed the increase of domestic exports, as a matter of course. The year 1847 was that of large exports of breadstuffs, as well as of the operation of the present ad valorem tariff; in that year the value of breadstuffs exported increased $41,000,000, and the aggregate value of exports $49,000,000, while the imports of goods increased but $6,000,000, and the federal revenue showed no increase. The explanation is found in the specie column, which shows over 24,000,000 imported in that year. In 1848, the gold discoveries reversed that state of things, and the United States became gold producers, but not considerable exporters until 1851, in which year cotton rose in exportable value, carrying the aggregate domestic exports to an extraordinarily high figure. This was enhanced by the gold exports, and the result was an importation of goods in return that produced an unexampled revenue. In 1852, the value of cotton fell materially, and breadstuffs did not increase, involving a decline in imports of goods and of revenue.

In the year ending June, 1853, there was a recovery in the exports of breadstuffs and cotton, carrying the domestic exports to a very high figure, although the gold export declined as a consequence of the larger exports of breadstuffs and cotton. The proceeds of these latter having been sufficient, with railroad investments, to keep the balance in favor of the interior, setting the current in that direction, and at the close of the year leaving the government with $23,000,000 in its vaults. The fiscal year 1854 set in with an enormous deficit in the crops of France and England. The usual wants of the latter had been about 64,000,000 bush. of which France supplied half, leaving both countries dependent on third markets for about 30 million bushels. In that year, however, the two countries required 170,000,000 bushels. The United States exported all they could spare at high prices, and in the Winter of 1854, exorbitant prices were obtained in New York. The exports of domestic produce reached an unparalleled figure, and the government collected upon the returned proceeds the largest amount of customs it ever received. In 1855 the United States crop failed, and prices were very high. The improved products of the succeeding years admitted of still greater exports of breadstuffs, while cotton rose to an unprecedented figure, making an aggregate of exports of domestic produce far in excess of any former one. This upward movement culminated in 1857, which was the year of the largest exports ever made of domestic produce, including specie, as it was the last year of the operation of the tariff of 1846. The year 1858 opened with a panic originated in the Stock market, but the series of bad harvests abroad seemed to be terminated, and a series of good crops, which cut off the American demand, set in. The figure for breadstuffs and provisions has declined greatly, but cotton and gold marked higher figures than before. The revenue of the government has been materially disturbed, however, by the low rates of duties under the present tariff, and there seems little chance that for the next few years, at least, the unaided action of the customs will overtake the expenditures of the government. The value of cotton rises in the double ratio of larger quantities and higher prices, and this development is greatly aided by the cheap food, cheap money and transportation of Europe, which usually compensates in increased purchases of cotton for diminished demand for food. The value has increased 100 millions in ten years, and the prospect for the next ten is far more satisfactory than was the prospect at the close of the Mexican war. The continent of Europe was then plunged in a political chaos which threatened the very existence of civilization. At this moment national interests are apparently consolidated on a permanent and favorable footing; commercial liberality seems to be the rule of governmental policy, while abundant harvests and abundant capital, with multiplied means of communication, seem to offer the broadest foundation for a new period of commercial and industrial prosperity. If the value of cotton has tripled in the last ten years, it may reasonably be expected to show the same progression in the next ten years.

The annual product of gold does not increase, but it is to be remarked that in the first six years of the gold discovery, the amount in the United States accumulated, in other words, the product was more than the export. In the last three years the reverse has been the case, and the amount in the country undergoes reduction. This seems to result from financial operations independent of the operations of commerce. During the years of railroad excitement, capital flowed towards this country and to the West for investment, carrying with it the current of the metals. Since the panic the reverse has been the case, and even the large exports of produce has not sufficed to redress the adverse balance caused by financial transactions.—*U. S. Economist.*

Hope soothes under sorrows, supports under afflictions and difficulties, and anticipates under trials.

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A Profitable Forty Acre Farm.

To show what "much labor on little land" accomplishes, we present a brief statement drawn from the Hampshire Co. (Mass.) Agricultural Society's Transactions, there given in the statement of Mr. Stebbins, of South Deerfield, on entering his farm for the premium of the Society.

The farm in question contains 41 acres, ten of it worn-out sandy land, when he came in possession, over twenty years ago. But he "resolved to have a better farm." To this sandy field (three acres the first year,) he applied clay at the rate of fifty loads per acre, followed by twenty-five loads of manure and 200 pounds of plaster. This was all plowed in together, the land planted to corn, and a fair crop was the result. After corn, oats were sown, and the ground seeded to clover. "By the use of clay and manure," he says, "I have made all my land as good as the best, and increased my pastures one hundred per cent. in quantity and quality of product.

As to deep plowing, he finds the best way to be to employ the subsoil plow. He turns under his manure four or five inches deep, and then subsoils the bottom of the furrow as deeply as possible. Corn is planted two years in succession, the better to mix soil and manure, and to fit the land for grass, and he now sows barley instead of oats, as a more profitable crop.

The secret of his success lies in the fact that instead of one hundred loads of manure as formerly, he now makes three hundred and fifty loads, supplying his yards freely with absorbent earths, and using salt, lime, and plaster, to a considerable extent.

In 1854, the products of the 41 acre farm, in usual farm crops, were worth a fraction under $2,000, and the net profits $1,116 75. There were twenty-three acres in mowing; thirteen acres in corn and potatoes, three in barley, and two in wheat. The reader may here see that a large farm is not an essential requisite to profitable management.

How to Keep Cows.

George Hull, of West Springfield, is the owner of five very profitable cows. Mr. Hull buys all his cows eat, and sells their milk. He has tried the various kinds of food usually fed to the milch cows, and concludes Indian meal to be the best and cheapest. Each cow receives six or eight quarts daily, according to her size, and about ten pounds of cut hay. Stalks and boiled roots are sometimes given, for a change. The meal is always scalded, as it goes much further than when raw. The meal is placed in two barrels, and boiling water enough poured on it to moisten the mass. Then the barrels are filled up with cold water and it is ready for use. Three pailfuls of the mixture are given to each animal, every night and morning, and as the mangers are water-tight, he turns it into the manger upon the cut hay. The cows get no other drink than this, the winter through. Boiled roots, he thinks, will not make milk taste, and one bushel boiled, is worth for milk, one and a half barrels raw. This he considers a healthy and cheap food for his cows. The secret of making cows milk free, and holding out till near calving time, lies mainly in these directions, viz: milking regular, feeding regular, and keeping them warm.

An Eloquent Extract.

Generation after generation have felt as we do now, and their lives were as active as our own. The heavens shall be as bright over our graves as they are around our paths. Yet a little while and all this will have happened. The throbbing heart will be stilled, and we shall be at rest. Our funeral will have wended its way, and the prayers will be said, and we shall be left in the darkness and silence of the tomb. And, it may be, that for a short time we shall be spoken of, but the things of life shall creep on and our names shall be forgotten. Days will continue to move on, and laughter and songs will be heard in the room where we died; and the eyes that mourned for us be dried and animated with joy, and even our child will cease to think of us, and will remember to lisp our names no more.

BLOWING OUT A CANDLE.—There is one small fact in domestic economy which is not generally known, but which is useful as saving time, trouble, and temper. If the candle be blown out holding it above you, the wick will not smoulder down, and may therefore be easily lighted again; but if blown upon downward, the contrary is the case.—*Scientific Artisan.*

From the American Stock Journal.

Cross Breeding of Cattle.

One of the first things upon which breeders need correct ideas is the outward *form* of the perfect animal. The wide hips, straight broad back, full pendant hams, deep chest and ample shoulders, should be known and appreciated. They should acquire a correct eye, study the points of value, and then select the parents of their stock, with a view to their best physiological development. The truth is, that the zeal for *imported blood* has thrown out of sight the true points in good animals which are furnished in our own home-yards. But *form* is not all that careful breeding may secure, the dairy value of stock may readily be enhanced. In effecting this, we have to select good milkers, capable of transmitting the same qualities to their offspring: a fact to be ascertained only by actual test. When a good breeder is found, the strain may be kept up. Native breeds are as permanent as thorough blood, that is their progeny are as likely to prove good in the same points, as the progeny of blood stock. This is an important subject, one that deserves the fullest attention at the hands of the dairymen and stock growers. If such a course would be pursued, in a short time there is no doubt that we should have a breed of cattle as celebrated for their milking qualities as some breeds are for their fattening qualities.

"Were I," says J. S. Seabright, in his "Observations on Stock Growing," "to define what is called the *Art of Breeding*, I should say that it consists in the selection of males and females intended to breed together with reference to each other's *merits and defects.*" A breed of animals may be said to be improved when any quality has been increased by art beyond what that quality was in a state of nature. It is for this reason that we should not breed from an animal, however excellent, unless we ascertain it to be what is called *well-bred*, that is, descended from a race of ancestors who have, through several generations, posse sed in a high degree, the properties which it is our object to obtain. "It ppears that the most important method of improving the *form* of animals, consists in the selecting of a well-formed female larger than the male." The principle depends upon the power the female has to supply her offspring with the nourishment in proportion to her size, and the power of nourishing herself from the excellency of her constitution. It has been remarked by high authority, that the size of the fœtus is generally in proportion to that of the male parent, and so vice versa, and that, if the nourishment is deficient, the offspring has all the disposition of a starveling. If the female is larger, there is a larger quantity of milk, and her offspring is more abundantly supplied after birth. We all know that it is necessary to have abundant nourishment from the earliest period of an animal's existence until its growth is complete, to produce the most perfect *form*. The power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the lungs, to which the organs of digestion are subservient. It is much more easy to select large-sized, well-formed females from a variety, than well-formed females of a variety that is smaller, as the shape of the chest depends upon the lungs; hence arises that remarkably large chest which is produced by crossing with females that are larger than the males.—This has been particularly noticed with horses that have been bred in this way.

In the breeding of cattle there are three objects to be kept in view: the form well adapted to fattening; the form for producing milk, and the form for labor. These objects have engaged the attention of the British agriculturalists; but experience has not hitherto justified the expectation that has been entertained of combining all these desirable properties in an eminent degree in the same race. That form which indicates properties of yielding large quantities of milk, differs materially from that which we know from experience to be combined with early maturity, and the most valuable carcass; and the breeds which are understood to give the greatest weight of meat for the food they consume, and to contain the least proportion of offal, are not those which possess in the highest degree the strength and activity required for labor. A disposition to fatten and a tendency to yield large quantities of milk, cannot be united in the same animal. Says George Culley, in his Observations on Stock, "the form of the animal most remarkable for fattening is high-sided and light-bellied—in a word, barrel-formed—while that of a great milker is downward." Experience has shown the Ayrshires and Devons to be the best for the dairy on the poor and sterile soils of New England, and the Short Horns as a breed to be indifferent milkers, requiring more food; but they improve by crossing with the native breeds when judiciously done.

G. TROWBRIDGE.

Camden, N. Y.

How to Test the Quality of Wool.

An experienced raiser of wool gives the following certain test of fine wool. The wavy folds of wool have been noticed by every one. Take a lock of wool from the sheep's back and place it upon an inch rule. If you can count from thirty to thirty-three of the spirals or folds in the space of an inch, it equals in quality the finest electoral or Saxony wool grown. Of course, when the number of spirals to the inch diminishes, the quality of the wool becomes relatively inferior. Many tests have been tried, but this is the simplest and best. Cotswold wool, and some other inferior wools, do not measure nine spirals to the inch. With this test, every farmer has within himself a knowledge which will enable him to form a correct judgment of the quality of all kinds of wool. There are some coarse wools which experienced wool-growers do not rank as wool, but as hair, on account of the hardness and straightness of the fibre.—*U. S. Economist.*

LIME WATER FOR APPLE TREES.—A French Journal relates of a landed proprietor near Yvetot, that he had in his garden some old apple trees which produced no fruit. Two winters ago he took some lime, which he steeped in water, and with a brush washed the old trees all over. The result was the destruction of all the insects: the old bark fell off, and was replaced by new, and the trees bore an excellent crop. Most of them have now acquired such renewed vigor, that all appearance of age has disappeared.

The United States Economist, in speaking of the cotton crop, says that the prospects are very favorable, and that it is not impossible that the exports of the coming year may be pushed to three and a quarter millions, at a price equal to that of 1858, say, average $65 per bale, which would give an export value of two hundred and ten millions of dollars, and impart to the Southern section of the country a greater degree of prosperity than ever yet fell to its lot.

From the Working Farmer.

On Rearing Calves.

BY HENRY C. VAIL.

In our last article we gave several methods for rearing calves. Mr. Emerson says:—"In Pennsylvania, heifers intended for milch cows are generally put to the bull at 15 or 18 months of age, in preference to leaving them run to a greater age." Mr. Isaac W. Roberts, of Montgomery County, has been very successful in raising and fattening cattle, chiefly of the Durham breed. It is his practice to take the calves of this fine breed, and, when two or three weeks old, put them with common native bred cows. He weans at three or four months old, when the calf is able to thrive well on grass alone, and the native cow going dry, is soon fit for the butcher, at a price which will nearly, if not quite, pay for her first cost and a fine allowance for pasturage. He thinks that calves thus raised and entering the winter in good condition, being properly housed and fed during cold and inclement weather, gain nearly a year on such as are prematurely weaned or fed on skimmed milk. He entirely disapproves of letting calves run three or four months with valuable cows intended for breeding, and especially where milking properties are to be retained.

With all those who desire to possess an improved and select stock, it is deemed highly important that they should raise their own calves: and this is rendered the more important, from the high prices usually to be obtained for calves of the best breeds. Mr. Colman gives the following information upon this subject, derived from his observations in Massachusetts: "A farmer of my acquaintance in the interior, raises all his calves from a large stock of cows. His cows are known to be of prime quality. His heifers are allowed to come in at two years old, and are then sold with their first calf, generally for $35, which he deems a fair compensation for raising. His calves are fed mainly on skim milk and whey, until they can support themselves on hay and grass. His steers pay a proportional profit when sold at three to four years old."

The English authorities say, that upon two cows calving at different times, seven calves may be fattened for the butcher in the course of the year. More than this may be done if the calves are to be reared for stock, and if some little meal or vegetables is added to their food.

Mr. Jaques remarks on the subject of feeding calves, that he generally lets them take a portion of milk from the cows for about three months, and prefers keeping them in the stall until they are about a year old, thinking that he gets better forms, rounder barrels, straighter backs, greater broadness in the loin and hips, by this management. Calves turned to grass at two or three months old become pot bellied, their backs bent, acquire a narrowness in the loins, and seldom get over the defect entirely. I believe it is better to raise them in the stall or yard the first season, as their feed is much more uniform, and their growth not interrupted by sudden changes. They soon learn to eat hay; and carrots or potatoes cut fine for them, will be highly beneficial. In all cases the calf should be taken from the cow as soon after its birth as the cow's udder is brought into good condition and her milk fit for use, and then he should be fed by hand. "In my opinion," says a very intelligent farmer of Stockbridge, "calves raised for other purposes than veal, should be early weaned from the dam, and nursed at least one year upon food adapted to give firmness and expansion of muscle, rather than to fatten them." Says another farmer, "One of the most important points in the feeding of the calf, is to feed him well when the grass first fails in the fall by frost. If suffered to fall off then, he does not recover, and suffers more by scanty food than other animals."

Some "premium" calves have been produced by allowing them to take the cow's milk for several months. We saw a large display of fine Devon stock in a western county of New York last year; the young animals were larger than any of the kind we have before examined. On inquiry we found their great size and beauty owing to the fact that they had been allowed to run with the cow and consume all the milk. Some of the calves were seven or eight months old. This practice soon dries up a cow, and where milking qualities are to be kept up, should not be encouraged.

On the farm of a celebrated breeder of Durham cattle, we saw several cows not able to supply milk enough to feed their calves. In such cases the whole energies of the animal seem to be given to beef making, common cattle being provided to supply milk for the calves.

The rearing of calves requires the exercise of a vast deal of common sense, which, in other words, means the exercise of judgment based on a perfect knowledge of their wants and capacities, kind of breed, structure of system, and future uses to which they are to be put.

Every farmer should bear in mind a few points.

1. No calf of decent proportions should be killed, as the country at large requires a greater amount of stock, and it will be a source of individual profit.

2. No calf should be allowed to run long with a dam intended for milking.

3. Such food should be selected as will develop the strength and size of the animal, rather than fatten it.

4. Never overfeed at any one time, and feed often enough to prevent absolute hunger.

5. Remember the necessity for shelter, and that it in part represents food.

6. Do not forget that a young animal should be kept gradually, but surely improving, never receiving any check from ill-treatment and mismanagement, and it will be impossible to forget at the end of five years' trial the

7th Rule—Pocket the profits sure to result from these hints.

How to Fatten Chickens.

It is hopeless to attempt to fatten chickens while they are at liberty. They must be put in a proper coop, and this, like most other poultry appurtenances, need not be expensive. To fatten twelve fowls, a coop must be three feet long, eighteen inches high, and eighteen inches deep, made entirely of bars. No part of it solid—neither top, side nor bottom. Discretion must be used according to the sizes of the chickens put up. They do not want room; indeed, the closer they are the better, provided they can all stand up at the same time. Care must be taken to put up such as have been accustomed to be together, or they will fight. If one is quarrelsome, it is better to remove it at once; as, like other bad examples, it soon finds its imitators. A diseased chicken should not be put up.

The food should be ground oats, and may either be put in a trough or on a flat board running along the front of the coop. It may be mixed with water or milk; the latter is better. It should be well slaked, forming a pulp as loose as can be, provided it does not run off the board. They must be well fed three or four times a day—the first time as soon after daybreak as possible or convenient, and then at intervals of four hours. Each meal should be as much and no more than they can eat up clean. When they have done feeding the board should be wiped, and some gravel may be spread. It causes them to feed and thrive.

After a fortnight of this treatment, you will have good, fat fowl. If, however, there are but four to six to be fattened, they must not have so much room as though there were twelve. Nothing is easier than to allow them the proper space; it is only necessary to have two or three pieces of wood to pass between the bars, and form a partition. This may also serve when fowls are put up at different degrees of fatness. This requires attention, or fowls will not keep fat and healthy. As soon as the fowl is sufficiently fattened it must be killed, otherwise it will still get fat, but it will lose flesh. If fowls are intended for market, of course they are or may be all fattened at once; but if for home consumption, it is better to put them up at such intervals as will suit the time when they are required for the table. When the time arrives for killing, whether they are meant for market or otherwise, they should be fasted, without food or water, for twelve or fifteen hours. This enables them to be kept some after being killed, even in hot weather.—*London Cotton Gardener.*

From the New England Farmer.

Thorough Draining.

BY HENRY F. FRENCH.

Heat will not pass downward in water. If, therefore, your soil be saturated with water, the heat of the sun in spring cannot warm it, and your plowing and planting must be late, and your crop a failure.

Count Rumford tried many experiments to illustrate the mode of the progagation of heat in fluids, and his conclusion, I presume, is now held to be the true theory, that heat is transmitted in water only by the *motion* of the particles of water, so that if you could stop the heated particles from rising, water could not be warmed except where it touched the vessel containing it. Heat applied to the bottom of a vessel of water, warms the particles of water in contact with the vessel, and they rise and colder particles descend, and so the whole is warmed.

Heat applied to the surface of the water can never warm it, except so far as the heat is conducted downwards by the vessel containing it.

Count Rumford confined cakes of ice in the bottom of glass jars, and covering the ice with one thickness of paper, poured boiling hot water on top of it, and there it remained for hours without melting the ice. The paper was placed over the ice so that the hot water would not be *poured* on to it, which would thaw it at once. Every man who has poured hot water into a frozen pump, hoping to thaw out the ice by the means, has arrived at the fact, if not at the theory, that ice will not melt by hot water on top of it. If, however, a piece of lead pipe be placed in the pump, resting on the ice, and hot water be poured through it, the ice will melt at once. In the first instance, the hot water in contact with the ice, becomes cold, and there it remains, because cold water is heavier than warm, and there it will remain, though the top be boiling. But when hot water is poured through the pipe, the downward current drives away the cold water, and brings heated particles in succession on to the ice.

Heat is propagated in water, then, only by circulation, that is, by the upward movement of the colder particles, to take their place.

Anything that obstructs circulation, prevents the passage of heat. Chocolate retains heat longer than tea, because it is thicker, and the hot particles cannot so readily rise to be cooled at the surface. Count Rumford illustrated this fact satisfactorily, by putting eider-down into water, which was found to obstruct the circulation, and to prevent the rapid heating or cooling of it. The same is true of all viscous substances, as starch, glue, and so of oil. They retain heat much longer than water or spirits.

The November number of the *Horticulturist* has an article, with a cut explaining this subject, and applying the above theory to wet land. The experiment was made with a box of peat saturated with water, and it is satisfactorily proved that it is not possible to warm the earth at the bottom, by putting boiling water on the surface, so long as no water is drawn out at the bottom.

As soon, however, as water was drawn out at the bottom, the hot water passed down, and the earth at the bottom was warmed.

"In this experiment, the wooden box may be supposed to be the field; the peat and cold water represent the water-logged portion; rain falls on the surface and becomes warmed by contact with the soil, and thus heated descends. But it is stopped by the cold water, and the heat will go no further. But if the soil is drained, and not water-logged, the warm rain trickles through the crevices of the earth, carrying to the drain level the high temperature it had gained on the surface, parts with it to the soil as it passes down, and thus produces that bottom heat which is so essential to plants."

Thus is shown one of the advantages of draining land. Many others might be named, did time and space allow. Since my article on Draining with Tiles was written, I have completed my work and plowed the drained land. The water disappeared from between the drains, as fast as they were opened. The low, wet places, where rushes had started up, and where the surface without the drains would have been covered several inches deep, became dry, through the whole space of fifty feet, between the drains. A springy side-hill, which we could not plant till the 6th of June, because it was so wet, and where my potatoes needed life-preservers in dog days, is as dry and friable as an old market garden. The 100 rods of tile drains which are laid in this field empty at one opening, and although the field has so dry and innocent a look, we find a large flow of water at all times, and after a short storm, a stream that nearly fills a three-inch tile.

B. F. Nourse, of Orrington, Maine, has been kind enough to send me a report of a Committee of the Bangor Horticultural Society, showing his operations in draining. Mr. Nourse writes me that he has this season extended his work, having now about 3½ miles of drains laid, two miles of which is with tiles from Albany.

I cannot make a better contribution to the cause than by giving extracts from that report:

"At the time of our visit in early summer, there was but one expression of satisfaction, not only from each individual member of the Committee, but from all the invited guests, at the appearance of the farm, the buildings, fences and crops. Although the season had been wet, yet the land was dry; the grass, grain, corn and trees were making a vigorous growth, being clothed with a richness of verdure which gave promise of abundant harvest. They all bore testimony to a careful, intelligent, scientific culture. Comparing this land with certain other portions of similar character in the vicinity, which had not received the same treatment, the contrast was very perceptible. The one was light, porous, arable, and free from water: the other hard, lumpy, cohesive and miry. The one had been drained, the other drowned.

The whole farm lies upon the northerly inclination of a hill several hundred feet above tide-water, and extends to the summit. The super-soil is generally clay loam with some gravel; the latter is present in some places in sufficient quantity to constitute gravelly loam. Near the top of the hill, the loam rests directly upon a ledge of rock similar to that which crests the neighbouring hills, and this ledge appears at the surface in a few spots of one or two rods extent each. When cleared and plowed, enough loose stones and boulders of granite were exposed on the surface to build the external wall. It might be called a 'rocky' farm. With the exception of two places, each of about two acres, the whole farm was wet and 'springy,' unfit for plowing or other agricultural process until quite late in spring or early summer. Water is found everywhere quite near the surface. The deepest well on the premises, dug in the dry season of 1854, extends down only thirteen feet. The excess of water made it cold and rather discouraging for any crop except grass, and even this was too readily killed by the action of winter frost. The surface soil is underlaid throughout (except immediately on the ledge of rock) by an impervious sub-soil or hard pan of stiff clay, quite retentive of water.

The first draining was done in 1852, on a piece of about 1½ acres, designed for a pear orchard. Thirteen drains fifteen rods in length, and twenty feet apart were opened down the hill. The duct or channel was made by placing two flat stones apart on the edges, and letting the upper edges fall together; these were wedged in place filled above with six or eight inches of small cobble and broken stones. Inverted turfs or boughs were spread upon them, to prevent the washing of earthy particles into the drain, and the earth was returned over all. These drains empty by bending at an acute angle into a main drain which is at right angles with the general course of the former, following a more gentle inclination westward, and laid with flat stones resting upon side stones covered and filled in as the others. This main discharges the water at the road-side which has never ceased flowing from it during the coldest winter weather. The land was then plowed across the drains with six oxen and the largest plow obtainable, opening a furrow twelve inches deep, in which followed a subsoil plow drawn by four oxen, cutting twelve inches deeper.

Upon this piece of land the frost comes out some days earlier, is later in fall, and of less depth in winter than in contiguous land undrained. The whole is dry enough for spading or plowing as soon as the frost is out in the spring, or within two hours after any heavy rain. During the drought of 1854, there was at all times sufficient dampness apparent on scraping the surface of the ground (with the foot in passing,) and a crop of beans was planted, grown and gathered therefrom, without so much rain as will usually fall in a shower of fifteen minutes duration, while vegetation on the next field was parching for lack of moisture.

The small drains were laid with sole tile that cost $24 50 per thousand, delivered at the farm, (double the cost in Albany, where manufactured,) and the mains with flat stones, filled in and covered as before described, the earth being returned easily with a two-horse scraper. A field of one acre and two-fifths 'thorough drained' in this way, forty feet apart, three and a half feet deep, required one hundred and five rods, including main, and cost $67 50 per acre completed. This field was plowed and sub-soiled each about ten inches deep, and a hoed crop taken off last season. During the heaviest rain no running or standing water could be seen on its surface. When your committee made its visit, we were shown an acre of this field, which had been manured and partly plowed for corn, when a protracted rain came on. The seed being in soak and manure wasting, after the second day's rain, it was resolved to prosecute the planting, and the plowing was finished, the land harrowed, furrowed, dressed in the furrow, and planted in a drizzling rain, working easily and well. The corn all came up, and has grown well; and still we did not see many clods or other appearances of wet weather working. Yet this was a clay loam, formerly as wet as the adjoining grass field, upon which oxen and cart could not pass on the day of this planting without cutting through the turf and 'miring' deeply. The nearest neighbour, a member of your committee, said 'if he had planted that day it must have been from a raft!'

In 1855, provisions were so high that such labour as ditches rendered could not be cheapened in cost per rod; but an experiment was tried on a field of three acres by laying tile drains three and a half feet deep, four rods apart, leading into a stone main, all of them covered and filled as before. An acre required forty-five rods—average cost 90 cents per rod, or $40 50 per acre. More time is needed with wet and dry seasons to test the efficiency of drains so far apart.

This field was plowed, but not sub-soiled last fall. It was in good working order in three days after the frost was out, two weeks earlier than the adjacent land was ready to plow. If not so thorough in laying the land dry and given it such an open, porous soil as is desirable, its evident benefit at so small a cost per acre makes the experiment worthy of imitation.

Appended are some statistics of the cost, as ascertained, in draining this farm.

MAINS.	Per Rod.
Digging 4 feet deep, 2 feet wide at bottom,	44 cts.
Hauling stone for channel,	15
Laying same,	12
Hauling and picking small stones for filling,	12
Sods, boughs or moss,	5
Returning earth with scraper,	12
	$1 00

SMALL DRAINS.

Digging 3½ feet deep, 20 inches at bottom,	37½ cts.
Hauling stone for channel,	12½
Laying same,	10
Hauling and picking small stones for filling,	12
Sods, boughs or moss,	4
Returning earth with scraper,	10
	86 cts.

TILE—TWO INCHES CALIBRE.

Digging 3½ feet deep, 6 inches at bottom,	33 cts.
Tile,	33
Laying same,	4
Stone fitting,	10
Sods, &c.,	2
Refilling,	6
	88 cts.

In conclusion we would represent that the concurrent testimony of all in this country and Europe, who have tried this system of draining, proves that the following benefits are obtained: It obviates the bad effects of drought, because the roots of plants and trees can descend more deeply for nutriment and moisture; by removing excess of water, it renders soils earlier in spring, and allows work to be done sooner after rains; it averts the effects of cold weather later in autumn: it prevents the heaving of grass and grain in winter, and the frost from penetrating so deeply; it enables us to deepen the surface soil, it accelerates the disintegration of the mineral matters in the soil, and improves its mechanical condition by promoting the finer comminution of the earthy particles; it hastens the decay of roots and other vegetable matter; it allows the fertilizing gases of the atmosphere and the water from rains to percolate deeply, and be deposited among the absorbent parts of the soil until the necessities of plants require them; it causes a more even distribution of nutritious matters among those parts of soil traversed by roots; by removing stagnant water, it prevents the cooling process of evaporation, and the abstraction of heat; it contributes to the warmth of the lower portions of the soil; it prevents meadows from becoming impoverished; it causes the poisonous excrementitious matter of plants to be carried out of the reach of their roots; it prevents the formation of acetic and other organic acids, which favour the production of sorrel and other noxious weeds, and it makes the surface soil of heavy lands light, and free from incrustation.

From the preceding facts, your Committee are fully of the opinion, that this system of underground draining would be of great public utility, and we cannot too strongly recommend it to every Horticulturist and Agriculturist."

Several of my neighbours have used some of the tiles which I procured from Albany, and although they cost us twice the Albany price, the freight exceeding the first cost, we are satisfied that they are cheaper than stone at the cost of hauling. One thing we have determined on, that we will have the tiles at a cheaper rate, and if nobody offers them at a fair price, some of the members of the Rockingham Fair will establish works and make them for ourselves, before many months. Probably we may have to pay something for an education, as most people do, who engage in new enterprises, but the tiles are to be supplied at a cheaper rate than double the Albany prices.

From the Rural Register.

The Four Organic Elements.

OXYGEN, HYDROGEN, NITROGEN AND CARBON.

Many farmers are not familiar with the full meaning of chemical terms used frequently by writers in agricultural works. The able editor of the *Scientific American*, is giving a brief description of the four organic elements, which we intended transferring to our columns, in order to assist such as are not familiar with chemistry, to understand their import. We commence with:

I.—OXYGEN.

Nine pounds of water consist of eight pounds of oxygen and one pound of hydrogen: 342 pounds of red-lead consist of 310 pounds of lead and 32 pounds of oxygen; 100 pounds of atmospheric air consist of 77 ponnds of hydrogen and 23 pounds of oxygen. One of the most curious facts of nature is the change in the properties of substances which results from their chemical combination. Oxygen and hydrogen combined together assume the liquid form: but oxygen on being combined with lead becomes solid, and the lead is no longer malleable, but may be pounded into powder. Oxygen, when separate or uncombined, has yet been obtained only in the gaseous state; but it is found in by far the largest quantities, in combination with other substances, forming either solids or liquids. It has strong affinity for more substances than any other of the elements. There is a great difference among them in respect; gold and platina are not disposed to combine with other things, they are old bachelors, but oxygen is a perfect Brigham Young—it wants to marry everything that it meets. It surrounds us on every side, but generally wedded to some other substance. It forms a portion of almost all the rocks which we see, and which make up the crust of our globe. Of 50 pounds of marble, 24 pounds are oxygen. In the three constituents of granite it forms 40 per cent. of the feldspar, just half of the mica, and more than half of the quartz.

All changes in chemical combination are accompanied by alterations of temperature. When oxygen especially combines with any other substance there is always a great exhibition of heat, and generally of light. Almost all fire is produced in this way. Burning a body is generally simply oxydizing it. This was the great discovery of Lavoisier. He found that when a body is burned in oxygen the body is increased in weight precisely as much as the oxygen is diminished. If we take a tight jar full of oxygen gas and drop a piece of sulphur into it, the sulphur burns with intense brilliancy and disappears. But if we weigh the jar we find its weight exactly the same as the sulphur and the jar of oxygen added together weighed before. The sulphur was not destroyed by being burned, but combined with the oxygen to form sulphurus acid, which is a transparent and invisible gas. If we heat the end of a piece of iron wire red-hot, and introduce it into a jar of oxygen gas, the wire burns with the most brilliant scintillations, throwing down black scales. If we collect these scales and weigh them, we find that for every 117½ ounces of iron that were burned, we have 141 ounces of iron scales; and if we weigh the jar of oxygen, we find that that has lost 24 ounces of its weight.

When Lavoisier announced his discovery, all the chemists in Europe immediately supplied themselves with delicate scales; and the weight of various substances, as compared with each other, has now been ascertained by different observers, thousands of times. A young chemist would ask no better passport to universal fame than the detection of a material error in one of these weights.

The combustion of a gas or of a volatile substan e, like sulphur or phosphorus, produces flame; while, if the substance is solid and not volatile, it burns without flame.

The heat of our bodies is kept up by slow combustion or oxydation. The air, on entering the lungs, is spread through thousands of cells, where it is separated from the blood by exceedingly thin membranes, through which the oxygen of the air is absorbed by the blood. Here it enters into combination with the carbon which has before been brought to the blood from the food taken into the stomach, burning the carbon as literally and truly as the coal is burned in the grate, and producing the same substance as the burning of the coal produces, that is, carbonic acid gas. Our lungs are perfect furnaces, which warm the body by a constant though slow combustion.

II.—Hydrogen.

Hydrogen makes its most common appearance to us in flame. Whenever we see a blaze, there are many chances to one that there hydrogen and oxygen are entering into combination: in other words, that hydrogen is being oxydized or burned. There are a few exceptions: sulphur, phosphorus, and other volatile substances, as well as those gases which burn at all, burn with a blaze; but most of the flames that we see—the blaze of an oil lamp, of a candle, of illuminating gas, of bituminous coal, of a wood fire, of nearly all fire—are, wholly or in part, the result of the combination of oxygen and hydrogen. In a blaze, the heat and light are all on the outside, as it is here alone that the burning gas can come in contact with the oxygen of the air. If we take a blow-pipe and blow the air through the flame, we set the whole body of the jet of gas on fire, and increase the heat enormously. In the compound blow-pipe, pure oxygen gas is mixed with pure hydrogen gas as they issue from the pipe, in the proportion of eight ounces of oxygen to one ounce of hydrogen, and the most intense heat is produced which it is possible to produce by combustion.

Oxygen and hydrogen combine to form water in the proportion of one pound of hydrogen to eight pounds of oxygen; or more exactly, 1,000 pounds of hydrogen to 8,013 pounds of oxygen. Oxygen and hydrogen also form one other combination, in the proportion of 1,000 pounds of hydrogen to 16,026 pounds of oxygen. This compound is a syrupy liquid of a nauseous bitter taste, which does not become solid even in a very intense cold. Without the interposition of other substances it is impossible to make oxygen and hydrogen combine in any other proportions except these two. If we mix 8,013 ounces of oxygen with 1,000 ounces of hydrogen, and touch the mixture with a spark of fire, the two gases combine with a flash and a report, forming water. There is so much heat developed that the water at first is expanded in vapour and is invisible, but it soon cools and condenses into the liquid form. If there is a single grain of either oxygen or hydrogen more than the proportion above stated, such surplus will not enter into the combination, but will remain separate and will retain the gaseous form. The other combination, which forms the syrupy liquid, is of just twice the quantity of oxygen to the same quantity of hydrogen.

Water may be decomposed by means of a galvanic battery, and the oxygen all carried into one jar and the hydrogen, though eight times as heavy, occupies precisely half the bulk of the hydrogen.

High Farming—Prof. Mapes' Farm—Super-Phosphate.

BY JUDGE FRENCH.

The following, by Judge French, of Exeter, N. H., we copy from the *New England Farmer*. Judge F. has recently returned from Europe, after having critically examined the methods pursued in England, France, Belgium, and elsewhere.

Not many weeks ago, we published a pretty careful criticism upon the farming operations of Mr. Sheriff Mechi, of Tiptree Hall, England, one of the highest farmers of that country, and our conclusions were, that although Mr. Sheriff Mechi might make money in England by underlying 170 acres of poor land with iron pipes, and pumping through them all his manure with a steam engine—by under-draining five feet deep, and doing other things accordingly—yet that his own statement showed that with American prices for the labor he charged, with American prices for crops he credited, he would run his farm ruinously in debt. His success, we said, results through the low price of labor mainly—the price there being about half our New England prices.

In the New York Weekly *Tribune*, of March 26, 1859, is an account of the farm of Prof. Mapes, near Newark, New Jersey. The account is very interesting to farmers, because of its encouraging results. The farm contains 121½ acres, and the statement shows that the expenses upon it for the year 1858 were $3,152.-60, and the income from it was $11,627 88,—leaving a net profit of $8,475 28, after paying all expenses and a fair rent for the land! Only 33¼ acres of the farm were in cultivated crops, the rest being grass and woods. The account below gives the items of income and expenses, with a balance which may challenge competition on either side of the water.

Having some acquaintance with Prof. M., having seen his farm, though not in the growing season, and having met his foreman, Mr. Quinn, both on and off the farm, and talked with him about the farm operations, we feel some confidence in our ability to form a correct opinion of this statement.

That the Professor is a man of great scientific knowledge of agriculture, and of wonderful tact in his application of science to the culture of his crops, everybody who sees him and his farm will at once admit. He understands the theories of farming, and his farm shows that he makes his knowledge practical. He raises the very crops that pay the best in his market, and he gets the largest crops and the highest prices. His farm is not indeed a regular farm, but a little market garden, a nursery, a seed establishment, and a fruit garden.

Yet these are departments open to many of us, and why cannot we make profit of them as well as he? To be sure, we cannot expect to get *eight and twelve dollars per hundred* for pears, if we could raise them in any great quantities, but our impression is, that nobody can show in this country better dwarf pear trees than Prof. Mapes.

He is the inventor of Mapes' Super-Phosphate of Lime, and it is not strange that his rivals in patent manures should detract from him and his successful farming.

Five thousand tons of this manure have, some seasons, been manufactured at the works in which he is largely interested, near his place. His farm is manured almost exclusively with this preparation, and acres were pointed out to us, on which were the finest fruit trees and beds of strawberries, besides the ordinary crops, which had received, for many years, no other manure.

The Professor stated in our hearing, at the New York Farmers' Club, that stable manure could not be sold in his neighborhood for $1,50 a cord, to be hauled one mile, because the super-phosphate is cheaper, and his neighbors who were present suggested no doubt of his correctness. Yet at Exeter, it costs $5 a cord, besides hauling, and this is probably an average price in the larger towns in New England.

After all our *buts* and *yets*, and apologies for Prof. Mapes' astonishing profits, there is a large balance of credit to be divided between his mode of culture and his super-phosphate. "How does he get so large crops at so little cost?" is the question. His explanation is found in three points—thorough drainage, deep and fine culture, and the use of super-phosphate.

He under-drains with tiles from four to five feet deep; he sub-soils eighteen or twenty inches deep, and works his roots and hoed crops constantly in summer, and with a little sub-soiler, drawn by one mule, and with the horse-hoe; and he applies to every acre at the start 600 pounds of super-phosphate, and a less quantity in after years, according to the crop. That this manure does wonders on his farm is not to be doubted. We have ourselves tried it several years, and always with favorable results, some of which have been published. We propose to continue our experiments the present year with one ton of the Nitrogenized Super-Phosphate now on hand.

And a word, by the way, upon this subject may not be amiss. We do not believe that farmers should in general purchase their manure, unless they are selling their crops. If they are, they must replace them by bringing on to the land the elements of fertility which have been carried away. This can only be done by buying some or other of these fertilizers. Super-phosphate of lime is admitted everywhere to be, excepting guano, the very best of fertilizers, and guano is difficult to apply properly, and is not adapted to all crops. The best farmers in England buy immense quantities of super-phosphates for their root crops in particular, and many of our farmers use it upon their potatoes and corn. Prof. Mapes has no secret as to his mode of manufacture, but publishes it as follows:

"The Improved Super-Phosphate of Lime was first invented, and was composed of 100 pounds of bone dust, dissolved in 56 pounds of sulphuric acid, to which was added 36 pounds of Peruvian guano, and 20 pounds of sulphate of ammonia; 100 pounds of this mixture were found to be equal in application, both in power and lasting quality, to 185 pounds of the best Peruvian guano.

"The Nitrogenized Super-Phosphate, which is found to be practically superior to the Improved Super-Phosphate, is composed of equal weights of Improved Super-Phosphate and dried blood ground."

Probably any chemist in the country will pronounce a fertilizer, consisting of the above elements, valuable for almost all cultivated crops, and we trust our farmers, in their progress in agriculture, will not forget that there are manures, besides what are found in their barn cellars—manures which contain no seeds of weeds, which are light of freight and cheap of application. In a garden of vegetables, we should hardly know how to raise our crops, without a bag of super-phosphate at hand. A cabbage will fatten on it, like a pig on corn-meal. We have tried every variety of fertilizer, and have more faith in Mapes' Super-Phosphate than in any other manufactured article of the kind.

We give the statement from the *Tribune*, as to Prof. Mapes' farm. Can any man show a better one? Does farming pay or does it not?

The following excerpt from the farm book of Mr. Patrick T. Quinn, the manager of the farm, which has been duly certified to by him as correct, will show the actual sales and expenses of the last year:

Sales from April 1, '58, *to April* 1, '59, *inclusive.*

Timothy Hay, 50 tons,	$750 00	
Salt Hay, Sedge and Black Grass, 91 tons,	564 20	
Asparagus,	40 00	
Beets, 500 bus. (some sold by bunch,)	250 00	
Greens, (Spinach, Sprouts, &c.)	108 00	
Cabbage, early and late Cauliflower,	675 00	
Kohl Rabi,	19 50	
Carrots, 900 bushels, at 43c.	391 30	
Celery,	195 20	
Corn, shelled, 550 bushels, at 85c.	467 50	
Corn, sweet,	60 00	
Egg Plants,	51 00	
Lettuce,	120 00	
Melons,	43 50	
Onions,	149 20	
Parsnips, 250 bushels, at 3s.	93 75	
Peppers,	6 00	
Squshes,	55 00	
Rhubarb,	310 00	
Radishes,	65 00	
Salsify (Oyster Plant),	25 00	
Tomatoes,	45 00	
Turnips, 1,200 bus. at 35c.	420 00	
Potatoes, (mostly sold for seed.) 700 bushels, at $1,	700 00	
Seeds, (all kinds,)	2,520 16	
Hot-bed and cold frames,	315 17	
Rhubarb plants, Grape vines, Raspberry, Blackberry, Currants and Strawberry plants,	1,017 00	
Grapes, Strawberries, Raspberries and Blackberries,	375 00	
Pears: Sales, 1857—$805 } 1858—$496 } av. sales,	610 40	
Fruit wines on hand,	470 00	
Corn fodder—Sorgho stalks and green rye,	240 00	
Hogs, Milk and Butter,	386 00	
Two choice Calves,	50 00	
Total,		$11,627 88

EXPENSES.

Eight workmen, 8 months, at $20,	$1,280 00	
Five workmen, 4 months, at $20,	400 00	
19,825 lbs. Super-phosphate of Lime, at 2 cents,	396 50	
Rent for 53¼ acres, at $8,	426 00	
Rent for 52 acres salt grass, at $1.25,	65 00	
Taxes,	31 50	
Wear and tear of tools,	100 00	
Use of team, at $3 per day,	453 60	
Total,		3,152 60
Total receipts,		11,627 88
Deduct expenses,		3,152 60
Net profits,		$8,475 28

New Use of the Stereoscope.

Professor Dove, a Prussian, has discovered that the best executed copies of steel or copper-plate engravings can be distinguished from the originals by placing them together in a binocular stereoscope, when the difference between the print, produced by the original plate, and the spurious copy, is seen at a glance. This will be a sure method of detecting counterfeit bank bills.

The Southern Planter.

RICHMOND, VIRGINIA.

Stock.

In our last number we called the attention of our Southern farmers to the fact, that we are annually paying out large sums of money to neighboring States for our supplies of mules, horses and hogs, which we thought could be raised at home at a cheaper rate than we have to pay for them. We will again urge upon them the importance of giving the subject some attention, and offer some remarks upon the sort of stock which we should raise, in order to be remunerated for our trouble. First, as to mules and horses. Mares of good size, compact, and well ribbed out, may be worked upon our farms for most of the year, and with a fair share of attention to their feeding and comfort, may be kept in good order, and these may produce a colt every spring, which, if a mule, is ready at two and a half years of age for use. Its value depends upon size and form: but may be set down at a figure over $100—while, if the owner has cared for it properly, and supplied it with food sufficient to keep it always in a growing condition, it is no high estimate to put the sum it will bring in market, or be worth at home, at nearly $200. The country *farther South of us* is so busily employed in making cotton at prices very remunerative, that they can afford liberal prices to the stock raiser for animals supplied to them; but we of Virginia cannot afford to raise our staples, wheat, corn and tobacco, at the present prices received for them, and buy mules at the sums they will bring even under the auctioneer's hammer.

We must have them, and we cannot afford to own them unless we raise them ourselves. If a mule at three years old will bring $150, is there not a handsome profit to the breeder who raises him? We believe so, and hope the farmers of Virginia will speedily ascertain for themselves whether it is so or not. We have among us many mares of good size, and well formed for raising mules—many of which are never put to breeding unless they become unfit for farm use by some accident. They might raise a colt every year, and still perform almost, or quite as much labor as they now do, without any injury to them—while the owner would be greatly benefitted by the receipt of a sum every year sufficiently large in most cases to defray all the expenses of the keeping, leaving him as clear profit, the amount of labor performed by the mare. We hope that the Executive Committees of our various Agricultural Societies will offer at their annual Fairs a large premium to the man who shall exhibit the largest number of good mules raised on his own plantation, and thus draw the attention and excite the enterprise of our farmers to undertaking an important work of economy and improvement among ourselves.

Of the science of breeding stock, we shall have but little to say, as the subject is so often thoroughly discussed in the columns of agricultural journals, by men of experience as well as science. We wish rather to aid the breeder in his efforts to promote *real and permanent improvement in all classes of his domestic animals*, by replacing the disgusting counterparts of "Pharoah's lean kine" by well-bred and thriving stock, which would redound to his convenience, pleasure, and profit. We do not mean to praise any particular kind of stock, or to exalt the merits of one class at the cost of another—but merely to beg every man who raises an animal on his premises, to try and have it of the *best quality* by bestowing on it the care which it requires to insure such a result. He must of course have a standard by which he shall measure excellence, and be regulated by it according to the use he expects to put this animal to—while he has no right to expect to raise animals possessing "good points" which cannot be found in their progenitors. "Like begets like"—and, consequently, he must select breeders with an eye to the almost certain transmission of their qualities to the offspring. Improvement in stock raising may be gradually accomplished by not very costly experiments in buying occasionally a good animal with the form and qualities we wish to copy, and crossing it with the best of the same kind we may have on the farm. The stock breeder who raises entirely with a view of selling such animals, is compelled to have the *very best quality* of every sort of stock, and should be honest enough to sell only the good ones of his flocks and herds, that the breed be not quickly depreciated and ruined. He cannot therefore sell animals intended for breeders at common rates, or in other words, for a price only equal to what the same amount of meat would bring in market. But every farmer may work a great change in the appearance and profits of his stock by incurring only occasionally, the expense of purchasing such breeders, and crossing judiciously and carefully. Who has not often seen the improvement manifested in our native stock by one cross with some of the improved breeds? and on the other hand, the ill effects of turning out as breeders, every animal who could be traced to a blooded ancestry, whether it possessed the "good points" or not, have been equally manifested by the rapid deterioration of the breed, and its decline in public favor. Witness the excitement that once pervaded the country in favour of "Berkshire" hogs, and the speedy reaction produced against them.

The first of the race imported to this country by Lossing, Brentnall, Allen, Bement and others, were really superior to any swine we had ever had in this country up to that time. But the ignorance of many breeders in turning out "culls and runts" together with the cupidity of some persons who wished to secure the high price for pigs which good ones did, and ought to have commanded, soon brought the whole stock into public odium, because under such circumstances, every man who bought an indifferent animal, laid his faults to *the breed instead of the breeder, or his own want of skill in selecting.* The "Short Horns and Devons" (without any reference to any of the other breeds of improved cattle) serve to show to what a degree of perfection animals may be brought by painstaking and proper diligence in selecting and developing certain points which may be desired for beauty, utility and thrift. These, with the different classes of horses, sheep, swine and poultry, serve to show that we can raise animals which shall be faithful copies of the models used—and hence the necessity of skill and attention in choosing proper models to copy.

If a farmer has a fondness for stock, and likes to see and examine thoroughly every individual member of his flocks, and possesses the requisite amount of knowledge to discover their good and bad points, it will always prove an interesting and profitable source of amusement to him. Many a weary hour will, in this way, be robbed of it's ennui, and many a small leak which would otherwise happen to his pocket-book, be stopped. The man who has no fondness for domestic animals, and who cannot appreciate their beauty or good qualities, ought to be deprived of them until his taste is developed by the want of the comforts and conveniences, which their possession now affords him. No man should own a horse who cannot ride him or minister to his wants—no man should have milk to drink who pays no attention to his cows.

Let the farmers of old Virginia begin at once to take the necessary steps to raise at home, such animals as they want. Import (whenever it is advisable) such animals as may be needed to impart fresh vigor and value to the stock we now have, by proper crossing—but to all, of every variety, give that attention and care which will insure certain, steady and rapid improvement.

Fine Horses for Virginia.

We have had the pleasure of seeing two fine stallions of the "Black Hawk" stock, and a mare and filly of good pedigree, which Mr. S. W. Ficklen, of Albemarle, has just brought on from Vermont, for the purpose of improving the breeds of horses here.

The Black Hawks are deservedly, we think, popular in public estimation, and we are glad whenever we hear of a fresh importation of them among us.

Mr. Ficklen spares no pains or expense to procure the best animals for stock breeding, and we hope may always meet with success in his laudable efforts to improve the animals and agriculture of his native State.

Several catalogues and papers (which we designed to notice) have been received, but in our efforts to get the paper printed and mailed before the beginning of the exhibilion of the Virginia Central Agricultural Society next week, we are compelled to defer them to a more convenient season.

For the Southern Planter.

Culture of the Chinese Potato.

MR. EDITOR:

The following is my experience of the culture of the Chinese Potato. Three years since, I sent $5 to a New York nurseryman and received 25 seeds enclosed in a tin box filled with sand, which was placed in a drawer near a fire place in which fire was never extinguished during the winter. In the spring the seeds were planted, but only one germinated, the remainder being killed, notwithstanding their warm situation during the winter. The first and second years the vine of this forlorn hope grew, but neither bloomed nor bore. This, the third year, little seed appeared—such as those I purchased,—about on the vine, and in a month or two, pretty, little white blossoms burst forth, which were soon followed by pods filled with fine seeds. The plant is certainly a curiosity, but to me not a profitable one.

By this time the root is supposed to be "*some*," perhaps requiring a stump extractor to bring it up. If such be the case I will inform you.

I have waited, you perceive, a long time for my first taste of the "*battattar*," and if it should prove as good as old, I will send you a slice. Yours sincerely,

YANG SING.

BRUNSWICK CO., VA., Sept. 1859.

The Points of a Good Hog.

A writer in the English Farm Herald very correctly describes the points of a good hog, according to our ideas of what they should be. The Suffolk is our favorite breed, to which the points here laid down will apply very correctly, except pendulousness of the ears. The ears of the Suffolk stand erect, and at about right angles with the forehead.

1. Sufficient depth of carcass, and such an elongation of the body, as will insure a sufficient lateral expansion. Let the loin and chest be broad. The breadth of the latter denotes good room for play of the lungs, and a consequent free and healthy circulation, essential to the thriving or fattening of any animal. The bone should be small and the joints fine; nothing is more indicative of high breeding than this; and the legs shall be no longer than, when fully fat, would just prevent the animal's body from trailing on the ground. The leg is the least profitable portion of the hog, and we require no more of it than is absolutely necessary for the rest.

2. See that the feet be firm and sound; that the toes lie well together, and press straightly upon the ground, as also that the claws are even, upright and healthy. Many say that the form of the head is of little or no consequence, and that a good hog may have an ugly head; but I regard the head of all animals as one of the very principal points in which pure or impure breeding will be the most obviously indicated. A high bred animal will invariably be found to arrive more speedily at maturity, to turn out more profitably than one of questionable or impure stock: and such being the case I consider that the head of the hog is by no means a point to be overlooked by the purchaser. The description of head most likely to promise, or rather to be concomitant of high breeding, is not one carrying heavy bone, but too flat on the forehead, or possessing too long a snout; the snout should be short, and the forehead rather convex, curving upward; and the ear should be, while pendulous, inclining somewhat forward, and, at the same time, light and thin. Nor should the buyer pass even the carriage of a pig. If this be dull, heavy and dejected, reject him on suspicion of ill health, if not of some concealed disorder actually existing, or just about to break forth; and there cannot be a more unfortunate symptom than a hang-down, slouching head. Of course, a fat hog for slaughter, or a sow heavy with young, has not much sprightliness of deportment.

From the Rural Register.

The Value of Bone Dust.

Prof. Johnston, in one of his Lectures before the New York State Society, presented the following views in regard to the action and effect of Ground Bones. We wish the farmers in every district of the country, would induce store-keepers at every cross-road and every village, to hold out inducements to the poorer classes to gather up the bones which are scattered about the road sides and commons, and have them either ground at home, or shipped to the nearest factories. The great difficulty in the use of bones, is the *obtaining a supply*. At some seasons of the year, there is no getting them for love nor money, unless engaged long before required. Prof. J. remarked:

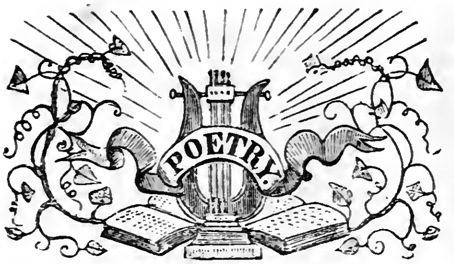
"I pass on to the subject of mineral manures. Of these, first I shall speak of Phospate of Lime. I showed you a certain form of mineral phosphate of lime, which was capable of being applied to the fertilizing of land. This phosphate of lime is brought in the form of bones, from abroad. These bones are boiled, crushed, and sold in the form of dust, which is applied to the land, and found to be exceedingly fertilizing. These bones contain about 33 per cent. of animal matter or cartilage, which will burn away, or when boiled forms a glue, phosphate of lime and magnesia. These bones, therefore, are fertilizing, because of the animal, as well as mineral matter contained in them; hence they will raise good crops where mineral phosphates would not, for if the plant requires organic as well as mineral matter, these bones supply it. But if the soil is rich in the form of organic matter which supplies nitrogen, then mineral matter alone without the animal would be more suitable; but if the soil be poor in both, then bones are better than either animal or mineral matter alone. This is the explanation of the failures of a trial of phosphate alone, or of burnt bone alone, instead of the natural bone. Some have found one better than another, and persons who have found the mineral part to produce good effects, have assumed that that is the only fertilizing substance in the bone--others, have found the converse to be true, and the two classes are at loggerheads about it. But both are, in fact, consistent with each other; for the bones contain two elements, both of which are necessary and valuable, and either of which, under certain circumstances, will be found to be so. Bones are applied, not only in a crushed state, but in a fermented state, and on the principle that if the food of an animal must be in a state in which the animal can digest it, so if you put into the soil any substance on which the plant is to feed, it must be in a condition to be dissolved by water and thus capable of entering the roots of the plant. That this may be so, bones are boiled and applied to land, in that state, for it is found that a bone when crushed will remain for years in the land, apparently unchanged. In Manchester, bones are used in the manufacture of glue, which forms a sizing for fabrics. The bones thus boiled come out soft, full of water. They are then easily crushed, and decompose easily when put in the soil. But to secure the easy dissolution of bones in the soil, fermentation has been introduced. The crushed bones, being mixed up with earth and allowed to ferment until the mass is reduced to a fine powder. This method is found greatly to facilitate the growth of crops. Thus a small quantity of the dust goes farther than in the other form. But there is one form in which bones are used with great profit—that is, when dissolved in sulphuric acid. The pulp is dried, sometimes mixed with gypsum, powdered and applied to the growth of turnips, and with great effect. In England and Scotland, it is the only manure for the turnip. But these dissolved bones are applied as a top-dressing for wheat and other grain, and when strewed over the surface are found to be very effectual. I may mention one instance, where 600 weight of dissolved bones were applied to a crop of wheat, and the product was raised from twenty-nine to fifty-three bushels an acre. Farm-yard manure applied under the same circumstances, raised the product to within six bushels of that amount per acre. This is an illustration of the superior effects of this bone manure. Bones are applied in this form to the grass lands of Cheshire, and with great profit. The lands there have been under dairy husbandry for many centuries. You will recollect, that the substances contained in milk when burned, are, some of them, the very materials which the bones leave when burnt. The cow extracts them from the soil on which it feeds, and it appears again in the milk, and is found by analysis. This has been going on for centuries, and this continual drain of the soil going on, it became impoverished. But the application of the bone was found to produce remarkable effects in restoring the soil, though the principle was not understood. The explanation, however, is found in the fact, that the milk and the bones, contained essentially the same substances, and that the latter restored to the soil, what had been taken from it by the animal. Here you see an illustration of the application of the knowledge acquired by the analysis of the bones and the milk, to practical husbandry. The discoverer of the value of this kind of manure, applied to the grass lands of Cheshire, may be estimated from the fact that lands which once paid but five shillings, an acre of rent, have been made to yield forty shillings rent, besides a good profit to the dairyman. You see from this, how important it is to know the effects of certain kinds of husbandry upon land. *Dairy husbandry produces a special exhaustion of the soil*, and knowing this, and what substances have been taken out of the soil and carried off in the shape of milk, you know what to put in to reclaim it."

How to Shield the Grape Vine in Winter.

In looking over a back volume of the Maine Farmer, we find the following method of protecting the grape vine in winter. The writer claims to be a "live grape-grower—raises bushels of nicely ripened Isabellas every year."

"My method is this: I pinch all the growing shoots off the vine, as early as September. Then, in November, say 20th, (not too early) the canes are pruned exactly as they are to grow the next year, and every shoot that looks light-coloured and badly ripened, is cut back to a good sound wood. After pruning, all the canes are gathered together and loosely tied, or 'stopped' with woollen list. Then a good lot of leaves, or old strawy litter, is spread along on the ground where the canes are to lie, with a few sticks of wood to keep them out of the ice, comparatively dry; the canes are then bent and covered slightly, two inches, with the same leaves or litter; then heave over the whole some old matting, straw, or a thin covering of green boughs, and you are all right for the winter. Don't meddle with any of this rigging till April 10th, certain, and remove it after that time, at the commencement of a rain storm, or in cloudy weather. Let the vine still recline on the ground, and don't put it upon the trellis until the buds push, say May 10th; you will find out that year, whether or no this advice has been of any service to you."

American Ruralist.



From the Christian Enquirer.

Nothing but Leaves.

Nothing but leaves; the Spirit grieves
Over a wasted life;
Sin committed while conscience slept,
Promises made, but never kept,
Hatred, battle and strife—
Nothing but leaves

Nothing but leaves; no garnered sheaves
Of life's fair ripening grain;
Words, idle words, for earnest deeds;
We sow our seeds—lo! tares and weeds;
We reap with toil and pain
Nothing but leaves.

Nothing but leaves; memory weaves
No veil to screen the past;
As we retrace our weary way,
Counting each lost and mis-spent day,
We sadly find at last
Nothing but leaves.

And shall we meet the Master so,
Bearing our withered leaves?
The Saviour looks for perfect fruit—
We stand before Him humble, mute;
Waiting the word He breathes—
"Nothing but leaves."

The Bucket.

How dear to this heart are the scenes of my childhood,
When fond recollection recalls them to view:
The orchard, the meadow, the deep-tangled wildwood,
And every loved spot which my infancy knew:
The wide-spreading pond, and the mill which stood by it,
The bridge, and the rock where the cataract fell,
The cot of my father, the dairy-house nigh it,
And even the rude bucket which hung in the well—
The old oaken bucket, the iron-bound bucket,
The moss-covered bucket, which hangs in the well.

That moss-covered vessel I hail as a treasure,
For often, at noon, when returned from the field,
I found it the source of an exquisite pleasure,
The purest and sweetest that nature can yield.
How ardent I seized it, with hands that were glowing,
And quick to the white-pebbled bottom it fell,
That soon, with the emblem of truth overflowing,
And dripping with coolness, it rose from the well—
The old oaken bucket, the iron-bound bucket,
The moss-covered bucket, arose from the well.

How sweet from the green mossy brim to receive it,
As poised on the curb, it inclin'd to my lips,
Not a full blushing goblet could tempt me to leave it,
Tho' fill'd with the nectar that Jupiter sips.
And now, far remov'd from the loved situation,
The tear of regret will intrusively swell,
As fancy reverts to my former plantation,
And sighs for the bucket that hangs in the well—
The old oaken bucket, the iron-bound bucket,
The moss-covered bucket, which hangs in the well.

"Bringing our Sheaves with us."

The time for toil is past, and night has come:
The last and saddest of the harvest-eves;
Worn out by labor long and wearisome,
Drooping and faint, the reapers hasten home,
Each laden with his sheaves.

Last of the laborers, thy feet I gain,
Lord of the harvest! and my spirit grieves
That I am burdened not so much with grain
As with a heaviness of heart and brain;
Master, behold my sheaves!

Few, light and worthless: yet their trifling weight
Through all my frame a weary aching leaves,
For long I struggled with my hapless fate,
And staid and toiled till it was dark and late—
Yet these are all my sheaves.

Full well I know I have more tares than wheat,
Brambles and flowers, dry stalks and withered leaves;
Wherefore I blush and weep, as at thy feet
I kneel down reverently and repeat,
"Master, behold my sheaves!"

I know these blossoms clustering heavily,
With evening dew upon their folded leaves,
Can claim no value nor utility—
Therefore shall fragrancy and beauty be
The glory of my sheaves.

So do I gather strength and hope anew;
For well I know thy patient love perceives
Not what I did, but what I strove to do—
And though the full, ripe ears are sadly few,
Thou wilt accept my sheaves.

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.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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Slavery and Free Labor Defined and Compared.

BY EDMUND RUFFIN.

SECTION I.—Slavery, in some form, existing almost everywhere—Political and Religious Slavery—Hunger-Slavery—Pauper Slavery in England, present and in anticipation.

The industrial operations of all the world are carried on much more extensively, and also effectively, by slave labor than by free labor. This truth is demonstrable according to any proper or even plausible definitions of these terms. But as they are generally applied and understood, they convey much more of false than of true doctrine. The word slavery is almost always used to designate one kind of compulsory and strict bondage only—which is the subjection of the will and action of individual to individual, as in the system of negro slavery, as it now exists in these southern States and elsewhere. This kind, whether it be of blacks or whites, may be distinguished as individual or personal slavery. But the most destitute people of nearly all the world—and especially of the more civilized, wealthy, refined and highly improved communities—are, in different modes of subjection and of suffering, held under a much more stringent and cruel bondage, and in conditions of far greater privation, painful and inevitable coercion, and of suffering, than our negro slaves; and, therefore, should as much be deemed subjects of slavery in an extended and proper sense. It has been found difficult, if not impossible, to offer a general definition of slavery, which shall be comprehensive and yet strict, concise and clear—and I cannot expect to succeed in attempting what so many other and more able writers on the subject have failed to accomplish. What I understand as the general condition that constitutes slavery is the subjection of one individual, or class, to the authority and direction of another individual or class, so that the subjected party is compelled (no matter by what means) to labor, serve, or act, at the will and command, and for the benefit or objects, of the ruling individual or class. This definition will cover our system of negro slavery and that of the white serfs of Russia—and also the political subjection of some entire populations and communities to either resident or foreign despotic rulers—of inferior classes or castes, trodden into the dust by superior and privileged classes or castes—also the (mis-called free) poor laborers of every densely peopled country in Europe, where the supply of labor exceeds the demand of employers or capitalists. The definition would also, and properly, include as slavery the abject subjection of various peoples to their priests, who, claiming authority in the name and as the ministers of God, established their own unlimited influence and rule over their superstitious, bigoted and ignorant or fanatical believers and followers. And such establishments of either religious or political slavery (of like character, and also operating through intolerant opinion) did not invest the rulers with the less power, as absolute masters, for coercion, despotism, and the infliction of cruel sufferings on the subjected, because the objects sought were not always pecuniary or personal gain, but the power to advance some theoretical doctrine deemed good and holy. Thus the people of France were for a time the completely abased and crushed slaves of the blood-thirsty Robespierre and his immediate supporters, the *commune* of Paris. The early inhabitants of Massachusetts were scarcely less the slaves of their priesthood, whose gloomy and rigid despotism was exercised as being the will of the all-benevolent God, and who were reverenced and obeyed as if they were scarcely inferior in piety, and in just claims of authority, to the first apostles. Yet, during the respective times of these different despotisms, the people of France deemed that they only, of all the world, possessed a tru y republican and perfectly free constitution of government; and the people of Massachusetts, in their form of government, in the absence of foreign influence thereon, and in everything, except the influence and power of their priests, might have deemed (as their descendants still claim for them) that they enjoyed the freest and best government on earth. The now operating rule of the sensual, vulgar and villainous Brigham Young, Prophet, and almost the God of his many thousands of subjects and obedient Mormon followers, is one of the most stringent, efficient and oppressive systems of slavery, both of body and mind, that the world has ever known. Yet this system exists in the midst and under the shelter of our free political institutions of government, and where every slave of this vile tyranny may seek and find protection from the law, and also from public opinion.

Such and many other cases of political and religious enslavement rested upon opinion, and mere change of opinion could relieve the victims of such despotisms. But there is another kind of slavery, founded upon the conditions and circumstances of civilized, and what is claimed as free society—and which increases with its progress and its improvement and wealth—which no change of opinion can alter, and for which (as it has seemed so far) no effectual relief or important alleviation can be found, even by those wise statesmen and patriots and true philanthropists who are aware of all the evil, and who most deplore its existence and prospective increase. This condition, under the general definition stated above, is the slavery of labor to want. It is an obvious truth, and undeniable by those who might object to the wide scope of my definition, that the destitute members of the laboring classes of all dense populations (as of England,) who are eagerly competing with each other for the supply of the partial demand for their labor, and who, when obtaining employment, can scarcely buy the most wretched support with their scant wages, and who, yet, for such wages, undergo the utmost amount of toil that human beings can perform and live—that these most miserable millions are, not only in their excessive toil and suffering, but in reference to their actual coercion, as truly and fully slaves to want, cold, hunger, and every threatened greater misery of destitution, as even *lash-driven* negro servants of Virginia are slaves to their masters. If the former class could be as truly compared with and deemed equal to our negro slaves as to their respective shares of comforts and pleasures enjoyed, it would be a blessing to the falsely termed "free laborers," as great as any discreet and judicious philanthropist could hope for, and far greater than the most sanguine of enlightened statesmen can even conceive as a possible result of any feasible reformation.*

* Among all the great and well-founded claims of the benevolent and kind-hearted Henry IV. of France, on the love and gratitude of his subjects and countrymen, and to the respect of posterity for his memory, there is not one which has been more often and approvingly referred to, and will be longer remembered, than his expressed wish that "every French peasant might be enabled to have a fowl in his pot for the dinner of every Sunday." The great improbability of the realization of this benevolent wish (for its fruition was neither attempted nor expected) was what mostly caused it to be noted and remembered. The laborers and most destitute peasantry of France have never reached the condition of ease and comfort to enable them to have a "fowl in the pot" even for so much as one dinner in the week. The laborers of England are not only much below that standard of comfort, but have long been descending, and will continue to descend still lower. It is probable that the (so-called) free laborers" of no

The privilege of the English laborer to choose his employment and his master, even when such choice legally exists, does not prevent his service being truly slavery. For he has no choice but to toil incessantly for wages barely affording a scant and wretched support, or to starve—and no change of pursuit, or of service, can make that condition better. It is true that there is no legal prohibition to the laborer to change his service. But it is rare that any better situation can be found; and more generally, he who would abandon his actual employment in the hope of obtaining better, would be more likely to obtain neither new service or even still lower wages. This must be the case while, for every vacant place of a laborer to be filled, there are two or more idle and starving applicants ready to take the service with half if they cannot obtain whole wages. Such and other circumstances of difficulty in obtaining new employment practically debar the laborer from making the attempt to change his service. And when, after spending the prime of his life and strength as a slave to want and privation, the English laborer becomes, by sickness or age, unable to earn wages on which he and his family can exist, the regular refuge from absolute starvation is the pauper maintenance exacted by law from the parish—to which wretched condition for himself and his more helpless wife and young children, if any there are, every English laborer looks forward as his future destiny, scarcely less certain to occur than death. Under the Poor Laws and the Poor-house regulations of England, every semblance or pretence of what is generally and falsely called freedom disappears. According to the discretion and will of the overseers of the poor (acting under the general direction and authority of the poor laws, and in reference only to the pecuniary interest of the parish,) the man is hired out to whomsoever will pay the largest proportion of the cheap sustenance allowed by the parish—the wife is, by different location, separated from her husband—the young children, as soon as able to perform the lightest service, are "put out" for their support, or a portion of it, to any who will so employ them, and, later, bound as apprentices, for labor of any kind and at any place, to serve their masters (as personal slaves) until they reach twenty-one years of age. In short, there is as much and as rigid coercion of the paupers, as painful to endure, and with as little choice of the place and manner of their service, or of care used for their comfort, as in the exceptional cases of the few negro slaves in Virginia who are, indeed, hardly and cruelly treated. It is not necessary to add, for the information of any who are acquainted with both systems of slavery, that, in comparison to the English pauper, and even to his earlier condition as the over-worked, under-fed and suffering hireling laborer, supporting a family on regular wages, the general condition of our negro slaves is one of comfort, ease and happiness.*

But between the times of the early and usual pauper slavery of the English laborer in his childhood and through his minority,

other country of Western Europe are able to indulge in the very limited consumption of animal food that the good King Henry could only venture to hope that his poor peasants might at some future time enjoy. But this blessing, unattained and unattainable by the free laborers of Europe, is truly, literally and fully enjoyed by nearly all of the negro slaves of this country; and it may be asserted in all individual cases, except of the very rare exceptions of slaves being denied animal food. Not only would the usual allowance serve to supply an ample meat dinner for every Sunday, if it were so appropriated, but so much more than that amount as will supply some meat every day in the week to every laborer, and to every child, and to every aged, infirm and useless slave on our plantations. A deficiency of bread, so often suffered by every laboring class in Europe, is a thing almost unknown among our negro slaves. The most unfeeling master, who knew and consulted his own interest, would never permit a deficiency of bread to exist.

* In PIGAULT LE BRUN's romance, "Mon Oncle Thomas," designed to satiarize the legislation and policy of the revolutionary government of France, he supposes the establishment, in the Island of Juan Fernandez, of a colony with a constitution designed to provide for a perfectly free people. One of the fundamental principles adopted was that no citizen should pay any tax except by his own voluntary choice and individual action. And there was only one general tax imposed by law, which was upon respiration. No citizen was compelled, or even required to pay this tax. He was entirely free to omit the payment, provided he preferred and choose also to cease to breathe. But to breathe, without paying the tax, would be severely punished. This satire would be not at all exaggerated if applied to the "freedom" of the English laborer. He is, by law, entirely free to choose his employer and his employment, and to refuse to labor, except for fair wages, and at his own discretion. But the certain accompaniment or consequence of his attempting to exert this legal privilege is that he must starve.

and his late pauper slavery in the decline of life, there is usually an interval of considerable though uncertain duration, through which it will, perhaps, be claimed that he is truly and completely a free laborer. This time lasts only so long as he still retains his health and the strength of manhood, and is not yet burdened with the support of an infirm wife and helpless children, and therefore, even with the existing inadequate average rate of wages, such an unincumbered and healthy individual laborer may earn more than enough for his daily maintenance. But even then, the disabilities and inflictions of pauper slavery are sensibly and oppressively felt. Every laborer, when possessing most strength and skill, and even when also exhibiting industry and general worth of character, and however healthy, and entirely free from family or other incumbrances, still is regarded by every poor-rate payer and by every parish official as a prospective pauper; or one who, though not yet chargeable to the parish, will surely become so thereafter, when his health fails, or old age approaches, if not much sooner. The most independent laborer regards himself in the same light of a pauper in a state of transition. Therefore, there is an unceasing struggle of all who have to pay poor-rates, and of the parish authorities, to prevent the entrance and legal settlement in their parish of any new laborers from abroad. Such legal settlement, and therefore a future legal claim for support, in infirmity or want, would be obtained by any new-coming laborer being hired by the year, or being the tenant or occupant of any hovel for a home as long. Therefore employment of such persons under longer engagements than as laborers by the day, and, even for them, any fixed residence in the parish, on rent or otherwise, are systematically and rigidly denied to all such outsiders. If induced by greater demand for labor, and the hope of more regular employment, or any other considerations, to seek work in a different parish from his own, the laborer can only do so by walking every morning from, and returning at night to, his legal domicil—often it may be in a crowded, filthy and pestilential village or city. This residence may be miles of distance from his place of employment and daily labor, to be twice walked over every day, and through all kinds of weather. If, by unlicensed intrusion, such laborers continue to occupy any vacant and wretched huts for temporary shelter, the covering roofs are torn off by the owner, if he cannot certainly prevent such occupancy by more gentle means. Such a general state of things—every parish so defending itself from the entrance of laborers from all others—prevents even the most efficient laborers from obtaining new residences and settlements where better wages are offered, and discourages even the attempt to improve their condition by removal. It is very rare that any such attempt is successful. Thus, great disadvantages, amounting, perhaps, in degree to a deduction of 50 per cent. from the existing average amount of wages to be obtained, are inflicted on all of the only individuals who otherwise, and at any limited time, might be truly denominated free laborers. In this view, it may be asserted that even this class offers no partial and limited exceptions to the general conditions of pauper or hunger-wages slavery—and that there are none free of all the class of day laborers in England. If the laborers who are most independent, and most capable of earning the best wages, are thus subjected, by a system over which they have not the least control, to disadvantages and losses, amounting to the value of half of what might otherwise be their earnings, or even to half of that half, there can scarcely be a question that the laborers so burdened are, to that extent, slaves to the indirect operation of the pauper system of bondage, in advance of its direct and more complete coercion.*

SECTION II.—The still worse Slavery in British Coal Mines—Slavery of impressed British Sailors—Military Slavery—Few free laborers, and many millions of miserable slaves of England—False pretences of England of opposing Slavery.

The foregoing positions, though applying correctly to all the necessitous hireling poor of Great Britain, were designed more especially in reference to agricultural and manufacturing day laborers. But in this broad and deep exposure of slavery, accompanied by

* In an article of "*Chambers' Journal*," most appropriately entitled "The Slave System of England," (republished in the "*Living Age*" of July, 1847.) there are affirmed, on official authorities, both the general system of common usage, as stated in general terms above, and also sundry particular extreme cases of much greater enormity in the cruelty of the inflictions and of the sufferings of these victims of the industrial policy, and success, and grandeur of England.

extreme suffering, there is a still deeper abyss of misery and abasement, for the numerous laborers in the British coal-mines. According to official documents of unquestionable authority, presented in reports of parliamentary committees, the severity of the toil, the exposure and the physical sufferings of these laborers, and especially of the women and children, are extended beyond the limits of human endurance; and yet, are exceeded in enormity in the ordinary and general violations of all the laws of decency which should guard female modesty, and of all the restraints which are essential to the very existence of morals, and to defend young children and helpless females from vice and the lowest degradation. Such horrors are of ordinary occurrence and common usage; and, as are stated in these official reports, (and which the system demands, and no husband or father can prevent his wife or daughter being subjected to,) could not exist or be tolerated anywhere except, as are these outrages on humanity, where, hidden from the light of day, and from the sight, and almost from the knowledge of all persons, except the wretched victims, who are the corrupted and brutalized slaves of the system, and their cruel and callous employers, and their underling task-masters and drivers.

Still more manifest examples of slavery, and even of individual or personal slavery, and of cases among the worst for injustice, hardship and cruelty, are presented in the impressment of sailors (and also of many who are not sailors) at discretion, without even a rule of selection by lot, and accompanied by the most brutal exercise of force and violence, by press gangs, to man the British fleets in time of war. In this manner the most worthy and useful men, in their industrious pursuits of an honest livelihood, were seized, and if attempting to flee, or to defend their freedom or their persons from violence, were struck down by bludgeons or the edge of the cutlass, and beaten until powerless or submissive. In numerous cases armed vessels, ordered to make impressments, watched the return of merchant ships from abroad to the ports of England, and the officers used that favorable opportunity to impress as many of the ablest men as could be spared from the crews when entering the harbor. Thus the victims, after a long absence, in sight of their homes, and in the joyful hope of soon again meeting with their families, were torn away for a forced and cruel and dangerous servitude, unlimited as to time, place or other conditions. This bondage, more usually than otherwise, was ended by death, or grievous wounds. The wife and children of the naval slave had probably passed the time of his service as pauper slaves—with the additional and worst misery of not even hearing from the captive and enslaved husband and father. Yet this system of impressment (and which has not even the direct sanction of law,) has been the custom and general usage of "free" England (professing to detest slavery), and it will be renewed in practice in the next and every naval war.*

Who, unless an impressed English sailor, can be more a wretched and even a personal slave, than a Prussian soldier? Yet to this terrible servitude every Prussian subject is bound for fourteen years, if so long needed by the government, at any time between the ages of twenty and fifty years. And though the duration and hardships of legal military service may be less in the other countries of Continental Europe, yet throughout, all men of the lower classes are subject to suffer this addition to the rigor and wretchedness of their otherwise ordinary condition of slavery to want, hunger and misery.

According to these views, there are but few countries in the world, and few existing conditions of society, in which the destitute or the poorest laboring classes are not truly slaves, in some one or other form. And of all the various kinds of slavery, the most wretched condition for the slaves (though perhaps the most gainful for the masters) is the slavery to want and hunger, to which are so generally subjected the so-called "free

* Adam Smith, when writing previous to the American Revolutionary War, and when the naval forces of Great Britain had never been near so numerous as since, even then stated that in time of war "forty or fifty thousand sailors are forced (by impressment) from the merchant service to that of the king," so as to increase the wages of sailors in the merchant service "because of their scarcity, from 21 and 27 shillings to 40 and 60 shillings a month." These SLAVES, in the long war with France, were increased to double or tripple---and the number required to be kept up for nearly twenty-five years. In 1810, there were 140,000 sailors and marines serving in the British navy---of whom much the larger number were slaves by impressment; and of these there were thousands who were neither sailors nor British subjects, and with whom, therefore, their being forced into this slavery had not the shadow of a pretext (such as is claimed in regard to British sailors,) of either legal or acknowledged usage.

laborers" of England—and to which, at some future time, must be subjected the laboring poor of New England, and of every other community and country in which negro or other personal slavery does not exist, and where there is dense population, and the arts of industry and the accumulation of wealth are well advanced. Whether negro slavery is considered the greater or the less evil, it is certain that its existence either prevents, or is incompatible with, the presence, in the same community, of class or hireling slavery. If negro slavery does not actually operate to exclude, or long postpone, the entrance of the more wretched and cruel slavery to hunger and misery, the former must necessarily end, before the latter kind can begin to prevail.

With these views I protest against the fitness and truth of the usually received definitions and applications of "slave labor" and "free labor"—and, in contradiction thereto, maintain that, in proportion to the respective populations, there are many more slaves in England, and in very much more suffering and painful conditions, than in all the negro slaveholding States of this Confederation.

Serfdom (or villanage) is a form of slavery (admitted to be such by all) which formerly prevailed through all Europe, and by which there are still held in bondage more than forty millions of persons in European Russia and the Austrian empire. The serf is personally and individually a slave to an individual master, but is so held in connection with the landed estate on which the serf was born. The proprietor has full as much legal or other power to maltreat or abuse his serf as has a master of negro slaves in Virginia. But he must sell or otherwise dispose of his serfs and land together to a new proprietor, and cannot separate the property in the serf from the land. This limitation may generally be some protection to the serf. But in many other cases it may well operate to his greater disadvantage. For when population is crowded, or likely soon to become so, on any one great landed estate or section of country, the continuance in that condition is a privilege to the slaves of very questionable value. The great evil and iniquity of the condition of serfdom, where it still continues to exist, consists, not in its being truly slavery, but in the slaves being of the same superior race as their masters, and equally capable of receiving the highest mental improvement. The serfs of Russia and Austria are of the same Caucasian blood as the nobles who own and rule them as masters, and are naturally as high in the scale of humanity as the families of the Russian Czar and the German Kaiser, and, if free, mig t rise as high in the scale of intellect and moral worth, with the aid of equal mental culture. Yet the existence of this great outrage on humanity, still maintained in the permanent and rigorous slavery of forty millions of Europeans, of the white and highest race, has not greatly shocked, and indeed has scarcely been noticed by, the English philanthropists, during their hypocritical and unmeasured denunciations of the slavery of the inferior negro race in these southern States of North America; which class has been as much improved, exalted, and otherwise benefitted by their slavery as the European serfs are held debased below the degree of mental and moral elevation to which they might attain, if in a state of freedom.

When considering the long-standing and loudly asserted claim and boast of England of being pre-eminently, and without exception, the "land of the free," and the enemy, the hater, and, as far as possible, the destroyer of slavery throughout the world, it is difficult to pronounce which is most remarkable of these several incidents of that claim—the entire falsehood of the asserted facts and premises, the shameless impudence of the vain-glorious boast, or the pharisaical hypocrisy of the empty pretension to superior virtue and charity.

England was formerly, and down to comparatively modern times, not only the great African slave-maker and slave-trader of the world, but also subjected the captives sent to the British West Indies to such cruel and murderous treatment, that when her late Act of Emancipation was executed (after 178 years possession of Jamaica,) there remained alive, of all the 1,700,000 Africans that had been imported and retained, and of all their increase, but a remnant of 660,000 to receive the boon of emancipation. This was about one slave left for every two-and-a-half imported and retained. Mr. Carey, who quotes this statement from the official reports, ("Slave Trade, Domestic and Foreign," pp. 14,) deems the original importations understated, and that in fact there had been as many as three Africans so imported for each one left alive and emancipated. (Compare this result with the fact that the 300,000 Africans which were imported as slaves into the now United States, have increased, under their very different treatment, to about 4,000,-000!)

England—and more and more so since she has become the great advocate for and actor in negro emancipation—has reduced to the most abject and suffering condition of hunger-slavery her own many millions of British born laborers. And this is the necessary element and essential cause and condition of England's success in achieving the great industrial and commercial prosperity and profit in which she stands proudly axalted and unrivalled among the nations of the earth.

England has subjected Ireland to both political and class slavery of the severest and most crushing oppression, and in different modes, from the first conquest to the present time. If at any one time since the complete conquest of Ireland, the whole land had been confiscated at a single and general operation, (as has been done throughout more than once, by piece-meal,) and it had been entirely shared out to new English colonists as proprietors and cultivators—and further, if the whole native population had also been bestowed as personal slaves on these same individual new land-holders, and the natives and their prosterity had been since held and treated in every respect as are the negro slaves in these Southern States—there would have been scarcely more of injustice, hardship and cruelty, than in the actual policy and treatment; and the population would have been placed in a condition not more truly of slavery, and beyond comparison more comfortable and happy, than they have experienced as "free" Irishmen.

Enormous as are the numbers of the miserable wretches made slaves by the home industrial system and policy of England, and of the large proportion of these murdered by the intolerable severity of its exactions, these amounts are small compared to the victims of another kind of slavery—that established by the subjugation of Hindostan. There, a population of more than one hundred and eighty millions of a superior race, though of a dark complexion, and having capacity for a high grade of improvement, has been, and are, politically enslaved, and to a degree of oppression exceeding any that Europeans could live under or submit to, and almost beyond the conception of any civilized and Christian people. The sole object of the governing and master-power and class, is to draw from the subjected race the greatest possible amount of tribute or tax that can be abstracted by force, and even with the aid and common use of physical torture. No measure of government, or regulation of police, or military severity and outrage, is deemed wrong or inexpedient, unless by its excess of injustice and cruelty it should defeat its object, and be less productive of gain to the Government than would have been a course more mild or merciful.

In the "Coolie apprenticeship" system, hypocritical England first commenced, and has since extended over many thousands of deluded Chinese and Hindoo victims (transported to her African and American sugar colonies) a new form of slavery, which differs in its results from her former system of enslaving African negroes only in its being more cruel. The term of service (if that is regarded and obeyed) is indeed limited to a stipulated number of years—but the obligation is not, therefore, the less rigid, or the less coerced by the scourge, and solely at the will and for the interest of the master,—and the infliction of this slavery is on people very far superior in natural capacity, and in actual improvement, to the negro race. The service being temporary, instead of perpetual, operates still worse for the Coolie slave, inasmuch as it is the interest and sole object of the master to get as much work as possible from the slave within his term of service. Indeed, the greater number do not live to the end of their engaged term—and of those who live longer, and might again become free, very few can be able to return to their native land. Even if the limit of the term of a Coolie's slavery is honestly observed (to which contingency there must be numerous exceptions), the very existence and obligation of that limit must operate to prevent any growth of attachment and kindly feelings between the master and the slave, such as must necessarily spring up, and strengthen with time, where slavery is permanent and hereditary—and which condition of mutual attachment is general between resident proprietors and their slaves in this country. This system of limited, but more cruel than continued slavery, has been the fate of many thousands of Africans, re-captured by British cruisers, and thus "apprenticed" in Trinidad and other of the Crown colonies. And this is the so called "liberation" of the re-captured African slaves!*

Yet, with all this support of slavery in its worst forms by England, Englishmen still continue complacently to listen to, and rapturously applaud, and receive as the justly due eulogy of their country, the often repeated rhetorical flourish of Curran, which will be here again quoted for the purpose of standing in contrast with the true facts of English action and merits in regard to slavery

"I speak [said the eloquent orator] in the spirit of the British law, which makes liberty commensurate with and inseparable from British soil; which proclaims even to the stranger and the sojourner, the moment he sets his foot on British earth, that the ground on which he treads is holy, and consecrated to the genius of UNIVERSAL EMANCIPATION. No matter in what language his doom may have been pronounced—no matter what complexion, incompatible with freedom, an Indian or an African sun may have burnt upon him—no matter in what disastrous battle his liberty may have been cloven down—no matter with what solemnities he may have been devoted upon the altar of slavery—the first moment he touches the sacred soil of Britain, the altar and the god sink together in the dust—his soul walks abroad in her own majesty—his body swells beyond the measure of his chains that burst from around him—and he stands redeemed, regenerated, disenthralled, by the irresistible genius of UNIVERSAL EMANCIPATION."

SECTION III.—The conditions of society in which only the labor of any country can be truly free—and then but temporarily.

The only civilized communities in which the laborers are not yet slaves (and of these the exemption is but a transient condition,) are the northern of the United States, or others (as Canada) under the like rare and peculiar circumstances. The necessary conditions (together with the absence of personal slavery) are, population few and sparse compared to territory, and ready means for subsistence—and, therefore, the demand for labor by employers exceeding the supply of persons desirous to be hired. Such conditions will rarely be found, except in a newly settled or thinly peopled country. Nor can they long continue even there, unless there is also a ready outlet for the subsequently growing and crowding population—and there are vacant lands and greater profits for labor inviting to emigration. The vast extent of vacant, fertile and cheap lands in the West

* The re captured Africans added to the Asiatic Coolies did not supply enough of "free laborers," or "colonists," to England for her sugar islands, and in 1851, (thirteen years after the complete emancipation of her West Indian slaves,) after some smaller operations, under authority of the British government, there were from thirty-five to forty thousand Africans bought (precisely as in the former slave trade) and shipped to the West Indies, and there "apprenticed." This transaction was so palpably the renewal, in another form, of the old African slave trade, that the British government was shamed out of it by public opinion; and has lately denounced the like procedure as being such renewal, when the example was followed by the French government. The small probability of any "Coolie apprentice." or "colonist," living as long as his time of slavery, may be inferred from the follwing fact, quoted by the Hon. J. P. Benjamin, in a speech (1859) in the Senate of the United States: "Out of 4500 Coolies imported into Jamaica in 1846 and 1847, only one-half remained alive in 1851." This system, originated by England, has been adopted in Cuba, as well as by France, and with the same general features and conditions, which must necessarily produce the greatest amount of suffering, and generally also death. From 1847 to 1858, there were shipped to Cuba 28,777 Coolies. Of these, more than 4000 died on the passage. The subsequent annual deaths were at least ten per cent. They were bound to serve ten years, at $4 a month, one-half of which is retained by the master, to be paid to the Coolie (amounting to $240) when he is released after ten years service. Of course, few will live to receive their retained wages—which would cost the master much more to pay than to engage a newly imported Coolie, under a like murderous engagement, for every vacancy created by death—to be either complied with, or avoided in like manner. It must not be supposed that the $2 a month contracted to be paid to the Coolie is to be at his free disposal. Out of that he must pay for clothing, medical service, and other demands sufficient to absorb the whole. It is most likely that both the wants and the ignorance of the Coolie slave enable his masters to keep him always in debt, for advances—and that no money payment is ever made, before the death of the Coolie serves to wipe out all claims of payment for his services. The precise terms of service of the Coolie slaves are not known. No doubt they vary in details in the different colonies. But whatever may be the variations, and whether under the English, Spanish, or French government and policy, the general law and operation of Coolie bondage, whether of Asiatic or negro subjects, has been correctly characterized (by the New York DAY-BOOK) as the rule or recipe "for killing the greatest number of laborers in the shortest time."

has served, and may long continue to draw away so much of the increase of population as to prevent in any of the northern States the supply of labor becoming equal to the demand. So long as the demand exceeds the supply, laborers can always obtain from employers fair and usually higher than fair wages. The laborer then may freely select his employer and employment—as more hands are needed for all than can be hired—and, when at work, earning much more than he needs for present subsistence, the laborer is free to be idle (if he so chooses) whenever he and his family are not destitute of the necessaries of life. This is the only condition of a country in which its labor and laborers can be deemed truly free; and this condition, but for the peculiar circumstances of North America, could not continue here long. Whenever the valuable vacant lands shall have been all settled upon, and there will be no longer sufficient inducements for emigration; and when, by the retaining and crowding of population, the supply of labor shall (as is inevitable) greatly exceed the demand, then in New England, as already has been effected in Old England, slavery to want will be established completely, rigidly, and in the form most oppressive and destructive to the laborers, but the most profitable of all slavery to the employers, to capitalists, and to the industrial progress, and for the accumulation of wealth for the community. The lower the wages, and the greater the privations to which the laborers can be subjected by their eager competition for employment and bread, the greater will be the profits of the employers, or the lower they can afford to sell their products, and the greater will be the increase of trade, of profits and of wealth to the country. This is the advanced and flourishing phase of the so-called "free labor" system—to the perfection of which system England has now more nearly attained than any other country of Europe, or any people that has heretofore existed—and with which there is also the most of want, toil, suffering and misery to the laboring class, as well as the most of gain, wealth, and luxury to the employing class and to capitalists. Massachusetts already begins to see the dawn of this much lauded splendor, and much coveted economical and social condition. And in truth, if the prosperity and wealth of the higher classes, and the extent of trade and of riches of the country in general, are the only objects sought, without any regard to increasing the destitution, misery, ignorance and vice of the poor, and the much larger number of the citizens—then I freely admit that the falsely so-called "free labor" system is the best policy, and that its ultimate fruition and results should be desired, not only for Massachusetts and all other "free" States, but also for Virginia, in preference to our existing system and policy of negro slavery.

SECTION IV.—Free labor and negro slave-labor compared in their results, and especially in reference to Massachusetts and Virginia—Causes of high prices of Massachusetts lands—The different operations and effects of the receiving and paying of government bounties and protecting duties.

Thus, the northern States, owing to peculiar but temporary circumstances, are, at this time, free labor communities, and will continue to be so until their population becomes dense enough to make the supply of labor greater than the demand. Massachusetts, as the oldest of the northern States, has longest enjoyed the alleged benefits of this condition of free labor, and has now approached nearest to the next succeeding condition of labor cheapened by competition and the beginning of slavery to want. Virginia is the oldest of the negro-slaveholding States, and has longest enjoyed the benefits and borne the peculiar and incidental evils of that condition. Therefore, when estimating the practical effects of the two systems, these two oldest States will be chiefly used as examples and referred to for comparison. The two different systems of policy and labor have each their unquestionable benefits and disadvantages. Both are good in their general operation, where long and fully established, as respectively in these two States. Yet it would be extremely disadvantageous, if not ruinous, for either Massachusetts, or Virginia to exchange its own established labor system entirely for that of the other.

The slave system of Virginia gives much more command and control of labor in a new country of sparse population, and makes it continuous in effort, and therefore, even if slower and less effective for short times of actual employment, it is far more efficient and profitable on the whole than would be free hireling labor. It is more suitable for extensive culture, under one directing and controlling head; and by permitting leisure, and opportunities for much social intercourse, to the master class, and requiring of them, and inviting to mental cultivation, there is a constant tendency to improvement of that class in mind, manners, and in social advantages and virtues. On the other hand, the facility for obtaining the comforts and pleasures of life also invite to self-indulgence, indolence, and negligent and expensive habits—and these encourage the kindred vices which often follow these errors.

The free labor system, if exclusively in operation from the beginning of a newly settled country (which, however, was not the case with Massachusetts or any of the older northern States,) would subject all employers and proprietors to great straits in the general scarcity and high price of free and hired labor. Hence, every economy of labor would be induced, and employers and proprietors would necessarily be themselves laborious, and frugal to the extent of parsimony. Their children, from an early age, would be trained to the industrious and frugal habits of their parents. No available means for gain would be neglected, nor any expensive indulgence, be permitted. Such circumstances would permit farming only on a small scale—so that the farmer, his wife, and sons and daughters, would constitute the greater number, if not all, of his permanent laborers and servants, for the farm or the house. Thus, every one is always at work, and helping to increase both private gains and the public wealth. But, on this account, none of the hard working rural population will have leisure for a high degree of mental culture, or for the improving pleasures of extended social intercourse. The very long and severe winters of Massachusetts, when scarcely any outdoor labor can be performed, more than anything else, have permitted and invited every person to acquire the lowest branches of school instruction. But this benefit does not prevent a general and increasing want of higher and more useful knowledge, for acquiring which the lower branches of school education are but the useful means.

The system of negro slavery requires large space for the best results, and large farms; and such extensive operations, and the looking to the main and great objects, lead to the neglect of details and of minor advantages. Hence, on one of our large, and also best conducted and most profitable farms—great as are the profits, and excellent the general management—there is yet enough of waste and neglected values, in small matters, to furnish a good income, if saved; and all of which would be saved by Yankee farmers on their small properties. For all these reasons, in proportion to their respective amounts of capital and labor, the small northern farmer would make and save double as much profit and accumulation as would a large southern slaveholder. Nevertheless, of all the before experienced northern farmers who have bought land and settled in Virginia, and who, either with or without slaves, attempted to exercise their boasted northern skill in farming on a large scale, I have never heard of one who did not fail, or, at best, fall much below the results of the ordinary management of his more careless and wasteful neighbors.

The larger space required for farming by slave labor is obtained without much cost in a new colony or settlement. Land is but one (and then the least costly) part of the cultivator's total farming capital, and its market price cannot rise or maintain a subsequent price, higher than the owner can afford to pay, or to retain so invested. If every farmer occupies twice as much land as might serve (with every small economy practised), and such is the usage of the whole country, it will follow that the general price of land will not rise to a rate higher than one-half of what it might be, if every owner would bestow as much labor upon, and derive as much product from, one acre as he does from two. This is one only of the several causes of land being higher priced in Massachusetts than in Virginia; though not a cause necessarily produced by slavery. For in many particular cases there are farms as highly improved in Virginia, cultivated with better knowledge of agriculture, better conducted (notwithstanding the admitted defects of economy), and more profitable for the capital invested, than can be found in Massachusetts, or any other of the old northern States. There are other and more operative causes for the higher prices of lands in Massachusetts, which will now be stated.

The tendency of the system of free labor (when the labor is also scarce and dear,) is to reduce the sizes of farms to the least possible extent on which the proprietors can make full use of their capital—and, of course, to increase in proportion the number of farms and proprietors. The unproductiveness of the soil in Massachusetts caused a large proportion of the population to devote their labors to navigation, fishing and whaling, trade and manufactures; and their natural and proper advantages and profits in these pursuits have been greatly increased by the bounties and discriminating and protecting duties enacted by the Federal Government, and which, raised from the whole country (and as of all taxation, mostly paid by the slaveholding States), yielded their benefits, as bounties, mainly to Massachusetts and the other New England States, because these were best fitted to profit by them. Thus, while the industry of all the agricultural, and especially of the slaveholding States, has been burdened with paying for all this unjust policy (amounting altogether to many hundreds of millions of dollars), Massachusetts has received the largest proportion of the benefits of the bounties so bestowed. The direct bounties for the codfishery, paid out of the federal treasury alone, have amounted nearly to $12,000,000—and nearly the whole of this has been received by Massachusetts and maine, which was long a part of Massachusetts. As the largest shipbuilder, navigator and whaler, Massachusetts has received the largest proportion of the benefits of the indirect federal bounties to navigation interests, and especially, and to this time, to American shipowners, and to the vessels engaged in the coasting trade. Her greater fitness for manufactures has also served to give her the chief profits derived from the protecting duty system of which the unjust and heavy burden has been chiefly borne by the slaveholding States, which have been unable to obtain any profit from these offered bounties. A protecting duty of 20 per cent on certain fabrics might afford ample protection and profit to Massachusetts' manufacturers, which rate of duty would not guard from loss a southern manufacturer. Thus, a virtual monopoly of the production and sale would be vested in the manufacturers of the section which had the best facilities to use the benefit. If then the duty were raised to 40 per cent, it would still offer so much more advantage to the northern than to the southern manufacturer, that the former, while making still increased profits, could undersell the latter, and retain the principal or exclusive business of production. For all these latter reasons, of far greater operation than better agriculture, the population of Massachusetts has been increased to much more than double of what it would have been if its whole industry were as nearly agricultural as that of Virginia. And this additional population drew from abroad, and from the government protection and bounties, far the largest share of the profits and wealth of Massachusetts. All this additional population, possessing and expending much more than a proportional amount of the general annual income of the State, afforded to the fewer agriculturists a home market of great and sure demand, and of immense value. The consequent prodigious benefit to the fewer cultivators and land owners may well be conceived, and the necessary effects in increasing the demand for and price of the limited amount of land, none of which was too remote from towns to profit by the peculiar benefits offered. For the demand for land was not to raise grain—(for the production of grain and agriculture proper have long been and still are decreasing and declining in Massachusetts—) but to raise green vegetables and other products which do not admit of distant transportation, for the supply of the many towns and villages and the population not engaged in agriculture. A "home market," when it is what the term should imply, really at home, is unquestionably of great value to agriculture, and which (in many cases) if justly and judiciously selected, the agricultural interest of a country may well afford to pay for, in consideration of its benefits. But, in the case of Massachusetts, there has been created in this extra and non-agricultural population and its wealth, a vast home market, by which every individual farmer is greatly benefitted, and which home market has been built up and is paid for by the bounty of the Federal Government, and mainly by taxes and losses borne by the slaveholding States. To compare fairly Virginia and Massachusetts in these respects, it would be necessary to suppose for Virginia an additional population of industrious and wealthy consumers of agricultural products, of more than double all the number now engaged in agriculture; and further, that these consumers were mainly supported and enriched, not by Virginia, but by Massachusetts. Under such change of conditions, the prices of land in Virginia would soon be doubled, and those of Massachusetts would sink to less than half their present rates. And if the latter had never had any benefit from the bounty system, and, on the contrary, had paid as much of the costs of that system as has Virginia, at this time, the population and wealth and prosperity of Massachusetts, as well as the price of lands, would scarcely be one-fourth as much as are now boasted of, and which are falsely asserted to be wholly the results of the superiority of free to slave labor.

SECTION V.—Other causes of high price of land, and further views of its operation, and that of "free labor." The condition of Massachusetts, so much lauded, is the infancy of a system of evil which is approaching maturity in England, and has fully reached it in China.

There are still other causes for the high prices of lands in Massachusetts, and which operate still more strongly in older "free-labor" countries. These will be now stated, and their peculiar and powerful operation fully admitted. Where the free labor system prevails, and hireling labor is scarce and high-priced, it will be a necessary consequence (as stated above) that the small landed proprietors and their families will not only be regular laborers, but will constitute the much larger proportion of the laborers on all small properties. They will also be the most diligent, hard-working, careful and frugal of laborers—because every member of the family is not only under more perfect direction and control of the proprietors, but also has every additional stimulus to exertion and care that self-interest, family affection, and the pride of proprietorship can offer. Every exertion of a hand, every minute of time given to labor, every smallest saving of products or means, will be so much of addition to the income of the family, and to the accumulation of capital. Such proprietor-laborers—and especially when pressed by poverty as much as if they were hireling laborers on the lands of others, (which is not unusual)—are more industrious, and more saving than any free hirelings, or any individual slaves. Therefore, the smallest farms, thus cultivated, will be made more productive than any others in proportion to extent, and will be held at higher prices than larger properties. Hence, there will be a continual tendency to reduce the sizes of farms, and a consequent enhancement of the market prices of small farms, to the highest rate at which proprietors are content to buy or to hold them. This rate is raised still higher by another cause not less operative than the love of gain, or the pressure of want. Besides the intrinsic and true value which all cultivated land has founded on its actual rate of production, every property has also an additional element of value, which enters into and increases its market price. This is the gratification and pride felt by and nourished in the owner, because of the mere fact of his being a proprietor of land. This feeling, and its effects, exist everywhere —but in the highest degree where such proprietorship is a rare distinction, and of course where such property is the most scarce, costly, and difficult of attainment. It is felt in Virginia—but with less intensity than in Massachusetts—and in Massachusetts much less than in France, (where the law has only of late permitted, and now operates to encourage and almost compel the extremely minute division of land—) and in France less than in England, where it is rare for land to be owned by any except the very rich. Independent of the products, or pecuniary profits of land, its possession confers a distinction something like the vulgar estimation of a title of nobility—which is still more empty, and destitute of real value and worth. This distinction of ownership may be rated very high in some localities, and very low in others. But everywhere it is something—and its rate is so much added to what would be otherwise the market price of lands. But this value of mere proprietorship is not in proportion to the extent, or to the productiveness or other true value of lands. It is the greater in different counties in proportion to the scarcity of the distinction, or the difficulty of its acquisition. It is also much greater, in the same countries as to small farms than large, or in inverse proportion to their respective extents. For the possessor of but five acres enjoys the much coveted and highly prized distinction and rank of being a farmer on his own land—and the owner of a thousand, or ten thousand acres, is no more. Hence, this pride of mere proprietorship might add $50, or $10 per acre, to the appreciation of a farm of but 5 acres' extent—and might not add more than $500, or half a dollar the acre, to a farm of 1000 acres. Hence the strong inducement, where such demand is strongly operative, to supply it by selling land in small divisions—and so to hold it divided. The present legal policy of France compels the division of the smallest landed property among all the children of a deceased proprietor. Consequently, very many farms, and separate properties, are from five acres to less than one acre in size. From other operating causes, in some parts of Germany the lands are mostly held in similar very small divisions. The owners, the "pesant-proprietors," as they are termed by J. Stuart Mills, (who greatly admires and applauds the system) are as needy as are hireling day laborers, and suffer as great privations. But, for the reasons stated above, they are the most diligent and frugal of laborers, and appreciate their position of proprietors so highly that many continue to hold and to cultivate farms which do not yield, as capital, a net profit of more than two per cent. In other words, if the fair interest of capital is five per cent, these small peasant-proprietors hold their lands (and could so sell them if choosing,) at market prices between twice and thrice the amount of their true intrinsic value, as rated by production. The distinguished (and generally correct) political economist, just quoted, pronounces these peasant-proprietors to be the most productive of all landholders and cultivators, and the most profitable agricultural workers in these countries. And he is right, if the most desirable and profitable end for the individual, and public interests of a State, is to obtain the greatest possible amount of gross products from the land, even if at the greatest cost of labor and privation, and want and misery, to the proprietors and laborers, and with the least of net profit, and of accumulation of increased capital to the proprietors and the State. Lands so held and tilled might indeed produce to the utmost capacity for every rood of surface—would be bought and sold at double prices—might perhaps bear a doubled population, all peasant-proprietors and all industrious laborers. But hand-labor would generally supersede team-labor and labor-saving machines, and net product would be diminished much more than gross product increased. Each proprietor's household would eat or consume nearly all of his own products, and leave a very small excess for sale, and to furnish any addition to the public wealth. The necessity for continual toil and privation of the whole population would forbid any indulgences in social pleasures, or intellectual improvement—and more and more, in each successive generation, extend the prevalence of general and brutal rudeness of manners, and ignorance. And, according to my views, this condition of a country population—such as exists in parts of France and Germany, and to which Massachusetts is tending, (and, if a truly self-supporting State, would be rapidly approaching, and would soon reach)—is as truly a great and deplorable evil, as it is supposed by many to be a great benefit and blessing. Considered in reference to both private and public interests and well-being—or in regard to the happiness, wealth, and mental and moral position of the whole community, and of every individual, this condition would be far less beneficial, and more deplorable, than that of a negro-slaveholding community, of but half the population on equal space, with a less economical and productive agriculture, in gross, and prices of land less by one-half or more. In this latter condition of things, the negro slaves would enjoy more leisure, freedom from harassing cares, and more comfort and pleasure, than the wretched and hard-working peasant-proprietors and laborers—and the fewer masters of negro slaves would have abundance of leisure, and use it for social enjoyments, and to improve manners and social education. If there were less of gross production, there would be much more of surplus and of net products, and of sales abroad, and of accumulation of private wealth, and contributions to the general revenue and accumulated wealth of the State. It has been admitted that the more that land is divided into small properties, and cultivated by the hands of the respective owners and their families, the more effort and frugality will be used, and more of gross products made and saved. But no important facility to save hard-labor can be made on such small spaces. The farmer on five acres only may indeed obtain from it the greatest possible product—even though his tillage is entirely by the spade and hoe. But he cannot afford to use a good plough or strong team—and still less a reaping or threshing machine. The more that numbers are increased, and even of industrious laborers, the nearer will they be to the eating, or otherwise consuming, the whole annual products of the country. Population, when increased to the most that the industry and products of a country can support, does not add either to the wealth or strength of the country, but the reverse; producing instead, poverty, ignorance, and weakness, and great suffering to all of the laboring class, and destitution, misery and even starvation, to many of the crowded population. Such is the actual condition of China, which, of all countries of the world, is the most industriously and effectively cultivated, the most productive, the land most valued and high-priced, and which also supports the most dense and laborious and frugal population. Yet this great and rich country barely feeds and sustains its numerous inhabitants, and supplies but a scant amount of the cheapest food to much the greater number—poverty is general, and extreme want and famine are not uncommon—there is but little surplus production to increase the general wealth, or for public uses—and the nation is even the weaker in military condition, because of its great populousness, which is only restricted from greater increase by misery, starvation and systematic infanticide. Yet, while the wretched condition of China is admitted by all, and also the causes for it here alleged, the very same causes, in their earlier operation and progress, and as applied to this country, are supposed by many shallow reasoners to be elements and evidences of wealth, strength, happiness and general well-being and greatness for this country—causes which are alleged to be greatly beneficial to the northern States, and which are even deemed the best examples for imitation, and objects to be earnestly sought by the slaveholding States! China presents the perfection and finality of the operation, of the system of high-priced lands, cheap free labor and dense population, which system is but beginning to be effective in Massachusetts, and is more than half advanced to completion in England.

Population, when near approaching, and still more when having reached its maximum, or extreme limit (of means for subsistence,) in any country, is admitted by all sound thinkers to be an enormous evil. Another great accompanying evil, also admitted, is presented in the wages of labor being too low to support the laborers. To these evils, I would add as another the high price of land, which is always an accompanyment and aggravation of the other two—but which, instead of being deemed an evil, is as commonly as erroneously supposed to be a great and most desirable public benefit, and a certain indication of great agricultural and general prosperity.

Land, as all other farming capital, or stock, has two kinds of value, of entirely different character and operation. The one is the value founded upon, and regulated by, the products and profits of the land under culture. This is the true and only agricultural and useful value; and which, if known and distinguished separately, will truly indicate the actual measure of the supposed agricultural prosperity of a country, where all the land is occupied. The other value of land is as capital merely, or a commodity of trade and speculation; and which is regulated entirely by the demand of purchasers, no matter for what objects, or under what delusion. There are also two different private interests of land-holders, as such, which ought to be, but are not often considered apart. The land-holder, as a cultivator or agriculturist, is not benefitted, but may eventually be much injured, by lands being priced higher than according to their true productive value. But to those who hold lands for sale; or as capital for trade, the higher the rise of prices, and the more money to be obtained by sale, the greater will be the gain of the individual sellers, in each transaction. But it is certain that such gains cannot be beneficial to agriculture, or to the common weal. For just as much as some members of the community, as sellers of land, may gain in factitious and baseless enhancement of price, is lost by others, as buyers in paying prices too high for the value of land founded on its production. If the lands of Virginia could, and as speedily as is falsely and absurdly maintained by the advocates for subsituted free labor, be raised in price to the present rates of Massachusetts, or to four times as much as their true productive value will now justify, the owners might individually profit as much, in that respect, by selling their lands to others who would bear the subsequent loss. But if the sellers remained residents of Virginia, or did not flee the country with their new capital in money, its quadrupled increase would scarcely secure them, as abiding residents, from being involved in the common ruin of the country, to be produced through its prostrated agricultural interests. To the seller of land, and as such only, can the too high price of land be beneficial. To the designed and continued holder, advanced market price is unimportant; and to the buyer, it is altogether injurious.

SECTION VI.—Value of a "home market," if truly at home; and why, and in what manner to be maintained by all the Southern States.

The subject of home markets was incidentally touched upon in a preceding section.

Its importance requires the more full consideration, which it will now receive.

The value of a home market for the products of agriculture, created in the new demand for these products of neighboring resident mechanics, manufacturers, traders, navigators, &c., and their families, I would perhaps rate as highly as do the advocates of the protecting duty and bounty system of the federal government. All reasoners would admit its great value to agriculture, and to all its neighboring country, where the home market grows up naturally, or without any fostering care and aid of government. Still more valuable would be a home market to its neighboring agriculturists, even if created and sustained by legal protection, provided the burden and cost of that protection were borne, not by the community receiving the benefit, but by another and remote community and interest—as are the different conditions of the older northern and southern States under the federal system of protection and bounties. Further: I will admit that, in some cases, it would be good policy for a particular State or community to impose taxes or burdens (and which would be but of temporary operation) on itself, for the purpose of introducing and establishing new and appropriate industrial pursuits, and so far creating a real home market in the demands of new customers, resident in the same community. To insure beneficial results, it would only be necessary that the subjects of protection should be selected with wisdom and judgment, and with a single eye to the interest of the community so taxed, as well as by its legal authority only. Thus, each and all of the southern States—which are almost exclusively agricultural, and have scarcely any important home markets in manufacturers and members of other industrial pursuits—would promote their own pecuniary interest by severally imposing heavy, and, in some cases, prohibitory license taxes on the sales of all such northern commodities as might be as well, or nearly as cheaply produced in the South; and also on all products of foreign countries, of which the prices are much enhanced by federal duties for protection, or which are imported in the South, not directly from abroad, but through northern ports and traders. The certain and indefeasible right of each State to impose such license taxes it is not necessary here to maintain. So far the new policy proposed might be maintained as correct on economical grounds. But there are much more important political and protective or defensive reasons. Such a system of policy, if adopted by but a few (and more speedily and effectually if by all) of the southern States, and fully and strictly carried out, would not only give to every such southern State valuable home markets and numerous new buyers and consumers (at home) of agricultural products, but would soon serve to bring the northern Abolitionists to their senses by forcing them to see their complete dependence, for their profits and wealth, on southern products and taxation, and on the tribute heretofore levied upon southern capital and industry, and mainly derived from negro slavery.

The arguments of the protectionists in favor of creating home markets by protecting duties, operating to exclude the taxed foreign commodities, if addressed to the manufacturing and bountied States, would be impregnable. For these States pay but a small proportion of the costs, and enjoy nearly all the benefits of the home markets so created. But when such arguments, in favor of federal protection, are addressed by northern advocates to the people of the South, they are both false and absurd. And their absurdity is greatly increased, and made more manifest and glaring, when southern men advocate such protection through federal legislation. When this is effected, as has been through the whole course of the protective and bounty system of this country, the southern people bear much the larger portion of the burdens (as of all federal taxes) and of the whole cost, and the "home markets" so created are not in the southern, but almost exclusively in the northern States, and mostly in New England, where they are no more "home markets" for the southern States and people than they would be if in Europe. Mr. Henry Carey, the most earnest and able recent advocate of the protective system, is entirely correct in regard to the great advantges of home markets which he sets forth, or of what he calls "placing the loom and anvil by the side of the plough;" but for this placing to be for our benefit in the South, the newly introduced loom and anvil should be by our plough, and not by that of Massachusetts. If the southern advocates for protection will direct their arguments and zealous efforts truly for the protection of southern manufactures and mechanical and other products, through State legislation—and thus, for building up new "home markets," not in the North but in the South—not for northern but for southern agricultural products; they would, for the first time, have reason and good sense, patriotism and sound State policy, on their side; and then their exertions, concurred in by their former opponents, and so made effective, would redound as much to the wealth, strength and political safety of the southern States, as the federal protective and bounty system has heretofore operated in opposite directions, and with most injurious effects on all these great interests.

SECTION VII.—How the removal of slaves from Virginia would affect the prices of lands and agricultural and general interests. Some absurd and detestable doctrines on this question cited and exposed.

In a preceding article, "On the effects of the high prices of slaves," &c. (published in DeBow's *Review* for June, 1859,) I maintained the following positions, which will here be again enunciated, but which will not require to be again proved or argued:

1. That the higher the price, or costs, of the whole of the farmer's necessary capital, the less must be the net profits of his farm and business, for products of equal amounts and values obtained.

2. That after the market prices of agricultural capital and stock have been duly adjusted and proportioned to the products and profits, if thereafter one large part of that capital, as slaves, should rise much in price, without a corresponding and equal increase of the value of subsequent products, then the market price of the other capital stock, the land, must be as much reduced, leaving the market value of the whole capital the same as before—or, otherwise, no new investments will be made in agriculture (capable of returning the ordinary profits of capital,) and no previous owners of farms can continue to hold them, unless to operate for less than fair profits on their capital, rated at its then market appreciation.

3. That the now greatly enhanced price of slaves (caused by their more profitable use and greater demand in the more southern States) has already operated to forbid new investments in agricultural capital in Virginia—and has begun to reduce, and will more and more reduce, the prices of our lands.

What was maintained, in arguing these propositions, as the effect of an undue high price for slaves, in lowering, in equal degree, the prices of lands (the only other great subject of our farming capital), would be equally true if these two subjects could be made to change places. That is, if, because of any artificial or extraneous influence, our lands could be raised to, and maintained at, for a time, a much higher rate of price than their products would justify, or than could return fair business profits, then the other great subjects of farming capital must be reduced in proportion—or otherwise investments in agriculture would cease, until the price of capital, in some other parts, or generally, for want of purchasers, had fallen low enough for profitable investment. As such reduction of price could not occur as to slaves, (because their price is regulated by the great and increasing foreign demand), the necessary and inevitable fall of price would take place in regard to lands, which therefore would soon lose all their recent undue or factitious appreciation, if not further sink below their former and then fair market value.

It will be a subject for separate and later consideration, whether (as usually supposed) the high price of land of itself is advantageous to agricultural interests, or the reverse. But the opposers of negro slavery having assumed as true the affirmative of this proposition, have eagerly seized upon the actual difference of the prices of lands in the northern and southern States, to use as their great argument for the destruction of negro slavery and its substitution by free labor. To strengthen this argument, the actual differences of prices have been greatly exaggerated, and the great and especial causes of high priced lands (as in Massachusetts) have been entirely overlooked, or designedly ignored. Further: It has thence been inferred, no less foolishly than falsely, that the removal of all the slaves from Virginia by sale (or, as many have contended, even by gratuitous emancipation,) would have the simultaneous or speedy effect of introducing as much free labor from abroad, and thus speedily and greatly would the prices of our lands be raised, and all to the great benefit and gain of the agricultural interest and of the commonwealth. Formerly, when theoretical anti-slavery opinions were general in Virginia, many persons, otherwise intelligent and judicious, would have readily concurred in this false doctrine. That time of general delusion in regard to negro slavery, happily for Virginia, has passed away. Recently and now there are but few who still entertain such opinions. But, lest I should be charged with contending against shadows, and exposing errors and absurdities for which no respectable authority or voucher can now be found, I will quote two passages from editorial articles of Virginian newspapers, holding different political creeds, and respectively attached to the two great opposing political parties. One of these is the Norfolk *Herald*, the oldest newspaper, and still conducted by the oldest editor of the commonwealth. In an editorial article of this paper (of 1853, as supposed) there was the following passage:—

"Let those who are lured by the prospect of gain, or who really believe that they can better their condition by emigrating to the new States, follow their bent, and take their slaves along with them. The vacuum may cause a momentary weakness, but it will be only to recruit with two-fold vigor. The places of every slave will in time be filled with hardy, industrious, tax-paying, musket-bearing freemen, of the right stuff to people a free State, which Virginia is destined to be one of these days, and the sooner (consistently with reason) the better for her own good."

This passage is but a strongly expressed enunciation and repetition of the old and hacknied general proposition of the anti-slavery school, and therefore needs no further notice. The next quoted authority requires more consideration, though upon other grounds than that of respect due to the opinions advanced, or the reasons on which they are placed. The following passage is part of an editorial article in the Richmond *Enquirer* of 1858, commenting on the movements in the then recent session of the Southern Convention. It was deliberately set forth and cautiously worded, and was subsequently reaffirmed by the editor:

"If a dissolution of the Union is to be followed by the revival of the slave trade, Virginia had better consider whether the south of the northern Confederacy would not be far preferable for her than the north of a Southern Confederacy. In the Northern Confederacy, Virginia would derive a large amount from the sale of her slaves to the South, and gain the increased value of her lands from northern emigration; while, in the Southern Confederacy, with the African slave trade revived, she would lose two-thirds of the value of her slave property and derive no additional increase to the value of her lands."

The *Enquirer*, in former years, and for a long time, was one of the ablest and certainly the most influential of the political journals of Virginia, and, perhaps, of all the southern States—and even now may retain something of the remains of that deference which formerly was due to its then influence if not to its always asserted claim (not always, however, even formerly, well founded) of being the zealous and faithful advocate of the rights and interests of the southern States. Further: in recent and at the present time, and in States other than Virginia, this paper may have acquired undeserved consideration as a supposed exponent of now prevailing public opinion, or of the opinions of some of the leading politicians of Virginia, founded on the known family as well as partizan relations of the chief editor. But for these different circumstances, either or all of which may operate abroad to invest the *Enquirer's* doctrines with some factitious and undeserved importance or false *prestige*, the several propositions above quoted would not, for their own worth or influence at home, demand either reply or notice. As it is, some comments will be submitted on the main and also the incidental positions of the editor. And first, before adverting to the older fallacies of the removal of slaves serving to bring in free labor and to raise the price of lands, I will ask attention to some other opinions expressed in this notable passage, which ought to excite indignation or contempt in the mind of every Virginian who is true to Virginia and to the South.

So far as I know or believe, there is not any other editor, or any respectable and known individual writer in Virginia, who would endorse and support these doctrines of the *Enquirer* in regard to preferring for Virginia a northern rather than a southern political connection. If there are any persons in Virginia, except the few northerners in feeling, and the still fewer abolitionists or incendiary northern emissaries and agents, who would, in any contingency, prefer that Virginia should be attached to the northern rather than to the southern States, there is yet no evidence of such preference—or at least of any but in the above-quoted declaration. If all the votes of Virginia could be polled on this particular question, at least nineteen-twentieths of them would strongly oppose the choice implied in the words quoted. And if there can be as many persons as one-twentieth who would, in any contingency, prefer political connection with the northern States to the southern, the fear of public indignation would prevent the avowal of that opinion, which would be so generally deemed hateful and abominable.

There is great virtue in an "if." It is easy enough to see that the "if" of the *Eni quirer* was designed to serve as a safe passage through which to crawl out of the difficulty, which, without the "if," would have been obvious to every reader. The *Enquirer's* implied preference and recommendation for Virginia, in the event of a dissolution of the Union, to side with and remain attached to the northern rather than the southern States, were presented as if based on a condition precedent—the re-opening of the African slave trade—which was then, and is even now, so unlikely to occur soon, that such a test of the *Enquirer's* principles was not likely to be practically applied. For various reasons, good and bad, strong, feeble, or entirely fallacious—the great body of the people of Virginia are strongly opposed to the re-opening of the African slave trade; and by very many of them that policy would be held in detestation and abhorrence. With all of this large number, and also with other very cursory readers, the words of the *Enquirer* might well pass as a mere indirect assertion that the re-opening of the slave trade would be an evil greater than the separation of Virginia from the South and her adherence to the North; or, in short, as but a hyperbolical expression of disapprobation of a policy that could not be too strongly denounced. Further, it is only upon the occurrence of the contingency that the Union is about to be dissolved, and, as a consequence, the African slave trade to be reopened, that the *Enquirer* recommended to Virginia to side with the North against the South. Until this very improbable and double contingency shall occur, the *Enquirer*, by virtue of its "if," will still assert its claim to be strongly southern, both in principle and in every doctrine advocated. But whatever may be claimed for it, the "if," of the *Enquirer* should not be deemed of the slightest value as protection from the general indignation which would be incurred by a naked and unconditional avowal of preference for the connection of Virginia with the northern States rather than the southern, in the event of a dissolution of the Union. The "if" is as worthless as a part of the argument, as is the entire series of propositions false as a whole. If the possible occurrence of the reopening of the African slave trade, after a separation of the Union, will indeed render it expedient and preferable for Virginia to separate both her natural and political connection from the more southern States and to adhere to the northern, then there would exist precisely the same reasons for such preference and action, without the re-opening of the slave trade, or any prospect or possibility thereof. What are the alleged reasons? In the "northern confederacy," as says the *Enquirer*, "Virginia would derive a large amount from the sale of her slaves to the South, and gain the increased value of her lands from northern emigration, while in the southern confederacy she would lose two-thirds of the value of her slave property, and derive no additional increase to the value of her lands." Now, if the latter portions of these assertions were true (as they are not), then they would operate as strongly, as reasons, without the revival of the slave trade. Without its being revived, the prices of slaves will be, as now, much higher—higher by two-thirds, the *Enquirer* says—than if the trade were reopened. Therefore, according to this doctrine, there are not only as great, but greater reasons and inducements operating *now* to sell off all our slaves, and have the vacuum so caused, in population and labor, filled by northern or European free laborers. And if by selling all our slaves, it were true, as the *Enquirer* maintains (and as I deny), there would be gain to Virginia in the (thereby caused) increased value of her lands, effected through northern emigration, then it is no less desirable now to seek that end, and through the means stated, and before the possible reopening of the African slave trade shall begin to diminish the present high prices of our slaves. Further—even if admitting fully the argument of the *Enquirer*, stripped of its non-essential contingencies—that it would be good State policy to sell all our slaves, and so invite immigration—yet as this can be done generally and completely only by legislative and coercive enactments, it is a legitimate deduction that this proper State policy ought to be so enacted and enforced, and thus that Virginia shall be, and as speedily as possible, freed from the presence of negro slaves, and rendered in policy, and, of course, in sentiment, one of the hireling-labor, Abolition and northern States. It the propositions of the *Enquirer*, fairly argued and carried out, do not lead inevitably to these conclusions, it would throw much needed light on the propositions asserted for any other legitimate deductions from them to be maintained by legitimate argument.

In pursuing the main course of the discussion, there were some important side issues passed by, which would well deserve the consideration of those who have faith in any of the propositions above quoted. Even if the contingencies supposed by the *Enquirer* had actually occurred, or were manifestly about to occur, *i. e.* "a dissolution of the Union, to be followed by the revival of the slave trade," it may be asked whether Virginia, if waiting so long to act, as recommended by the *Enquirer*, could then, even on the false grounds assumed, obtain the promised profit in selling her slaves to the South? Would the then all-powerful non-slaveholding and slavery-hating States of the northern confederacy (even now, eighteen or nineteen in number) permit the only two adhering slaveholding States, Virginia and Maryland, to continue the "iniquity" of either selling or holding slaves? And even if there would be any possible ground to suppose such permission to be granted, and the involved rights to be respected by the then all-powerful northern States, there is still another as important difficulty in another quarter, viz: What possible interest would the people of the more southern States then have to buy all the negroes of Virginia, at prices three-fold greater (as estimated by the *Enquirer*) than would be required for other slaves that they could then freely buy from Africa? And, even if pecuniary interest did not forbid so absurd a preference, what other inducement would there be for the more southern States to minister to the benefit and profits of Virginia by buying her slaves at higher, or even at any prices, and so faciliate her change to free labor, after Virginia had deserted and basely betrayed her section and her principles, and for this absurd hope of pecuniary profit, had chosen alliance with, and political bondage to, the northern States?

To be concluded.

From the Rural Register.

On the Culture of Wheat---The Necessity of Phosphates.

The lamented Professor Norton, shortly before his decease, delivered an address before the Senaca (N. Y.) County Agricultural Society, which we find in the Transactions of the State Society—from this address we make the following extracts, upon the culture of the Wheat plant:—

"This is a wheat county, and it is of much importance that the yield of that crop be increased, in place of continuing to decrease, as it has certainly done on many farms. I think that some light may be thrown on the cause of this decrease, and on the nature of the crop, by a brief account of the wheat plant in regard to the structure of its several parts, and their chemical composition, finally bringing the information thus collected to a practical bearing upon various questions connected with its cultivation. It will be seen that there is a very great number of points to which attention may profitably be directed. These will, in the present case, be impressed by the great value of this crop to our country generally. I will first devote a few words to the structure of the plant, and of its various parts.

"That part to which our attention is first naturally directed, is the seed. Viewed externally, this is merely a small brownish or whitish oblong mass, presenting a white interior when broken. If kept perfectly dry it will remain unchanged for a thousand years; but when exposed to moisture and warmth, a change speedily occurs. The seed swells and soon opens its outer covering to permit the root and stem to shoot forth. This is all very simple in description, but it is only after years of study that we have arrived at even an imperfect knowledge of what really takes place at this time. I do not purpose to go at length into a scientific account of germination, but will mention in few words the changes that occur. The seed in its natural state contains a dry white substance, which is for the greater part insoluble in water; this is mostly starch. Now the young shoot, until it reaches above the surface of the earth, and until its leaves begin to expand, must draw its nourishment from the seed, but since the principal part of the seed is insoluble, how is this done? It is found that at the time of germination, a substance called diastase is formed, which has the power of rapidly converting the starch into a species of sugar, or a species of gum. Both of these are soluble in water, and consequently go immediately to nourish the young plant. Now this change will not take place properly, save under certain conditions. The soil must be moist, and not very cold, and the seed must be buried at such a depth as to be accessible to air. If there is no communication with the air, the seed will not germinate, even though the earth be warm and moist. Without air, the change by means of diastase, of the starch into sugar or gum, will not occur. This fact is often illustrated when we bring up earth from a distance beneath the surface, if thrown upon one side in the middle of a grass or grain field for instance, it will soon be seen covered with plants, and these in many cases entirely different from any growing in the immediate neighborhood. There seems no way in which we can explain many curious occurrences of this kind, except upon the supposition that these seeds may have lain in the ground buried deep, and consequently only grew when brought near the surface; warmth, air and moisture are thus seen to be necessary adjuncts to successful germination; but if we bring the seed immediately upon the surface, even under these conditions, it will not grow, thus showing a fourth requisite—the absence of light. Unless the position of the seed is such as to ensure all four of these conditions, it will not produce a healthy plant, and usually will not grow at all. This explains to us why so small a portion of the seed sown ever comes to anything.

"It has been shown by some authors from actual counting of the seed in a bushel of wheat, and by comparison with the yield obtained when a given quantity is sown, that when the greatest crops known are obtained, little more than half the seed sown vegetates. In the case of ordinary crops, the produce is not more than ought to be afforded by about one-third of the seed sown; the remaining two-thirds are lost, some buried too deep, some not covered at all, some destroyed by insects. One great advantage of the drill machine for sowing is, that the seeds are all deposited at an equal depth, and at an equal distance apart; the growth is consequently regular, and the plants are much less liable to be luxuriant, in some spots, and scanty in others. Covering with the cultivator or gang plow, produces something of the same effect. A considerably reduced quantity of seed will thus answer the same purpose, as none of it is lost. The saving of half a bushel or a bushel of wheat per acre becomes of immense importance when we consider the number of acres sown in any one year.

"When the young shoot has reached the surface of the ground, and has begun to expand its leaves, it is no longer dependent for food on the parent seed. Its roots have by this time begun to collect food from the earth, and there is a constant flow of sap upward through them. In good soils these roots will go down for several feet, and of course in penetrating so great a distance are much more able to draw abundant supplies for the plant; this shows the importance of artificially deepening the soil, when the subsoil is not naturally mellow, and of draining when this portion is constantly filled with water. In either of these cases, the plant might almost as well endeavor to extract food from a pavement, as from the subsoil, until it is improved. But if the plant finds a soil of proper depth, and well supplied with its requisite food, its growth is rapid, and opening its leaves it begins to receive food through the pores, with which a microscope shows their surface to be covered. These during the day draw in certain kinds of air, which in the interior of the plant, are converted into solid portions of its substance. That this is the fact, has been proved by numerous experiments. The part of the plant which thus comes from the air, is of course a clear gain to the farmer, as it does not exhaust his soil at all; and here is an advantage which the good cultivator obtains over the poor one; his plants had a rich soil well prepared for the supply of their wants, and shooting vigorously up, are able to spread out broad luxuriant leaves in the atmosphere, drawing in far more food from this source than the small yellow leaves of a poor crop could possibly absorb. The very air, then, is more bountiful to the man who treats his soil liberally.

"With all the appearance visible in the external growth of the wheat, every one is familiar. There are many points that have been ascertained, relative to the internal changes which occur in the stalk at different periods, and also during the formation of the grain, which time will not permit me to notice now. While the grain is ripening, the materials for its composition gradually leave the stalk, and that part loses by degrees its nourishing properties, until finally, nearly all the nutriment is concentrated in the grain.

"It now becomes necessary that we should enquire particularly into the composition of the grain. If in the first place we burn it, we shall find that nearly all of it disappears, so that from one hundred pounds of wheat there will not remain more than two pounds of ash. This ash has evidently all come from the soil; the other portion which has burned away was originally air, drawn in mostly from the leaves, in the manner that I have before mentioned, but also in part through the roots. This combustible portion being by far the largest part of the whole weight, we will attend to it first. By means of various chemical processes, the substance composing this part of the grain may be separated from each other, and with a tolerable degree of accuracy.

"The following analysis is an instance of the proportions in which they are found to exist in wheat:—

COMPOSITION OF THE GRAIN AND STRAW OF WHEAT.

Org'c part of grain.		Ash.	Grain.	Straw.
Starch,....	62.29	Potash,.......	23.72	12.44
Gluten,....	13.00	Soda,.........	9.05	0.16
Gum,......	1.21	Lime,.........	2.81	6.70
Oil,........	1.02	Magnesia,.....	12.03	3.82
Sugar, &c.,..	6.40	Oxide of Iron,..	0.67	1.30
Epidermis, .	7.20	Phosph'ic Acid,	49.31	3.07
Water,.....	9.79	Sulphuric Acid,	0.24	5.82
	——	Chlorine,......	——	1.09
	100.91	Silica,........	1.27	65.38
			——	——
			99.50	99.78

"The first analysis is from Dr. Emmons' Agricultural Report, and agrees pretty well with most of the examinations made by other chemists. Starch, it will be perceived, is the leading substance, and next to this is Gluten. The latter is the only body in the grain that contains nitrogen, and is consequently the source of muscle in animals that live on wheat. Take away this constituent of the grain, and feed an animal exclusively upon what is left, and it cannot thrive, cannot increase or even maintain the bulk of its muscle in the body; its strength will gradually decrease. Whenever we find any food which contains, according to chemical examinations, much of substances like this gluten, it may be asserted without fear, that such food is eminently nutritious.

"The other substances, the starch, impure sugar, gum, and oil, are of use in forming the fat of the animal, and also in keeping up respiration. This is one of the most curious and important facts discovered by modern chemists and physiologists. At every respiration, a portion of the starch, gum, &c., of the food, is consumed in the lungs, and in the blood-vessels of the extremities, for the purpose of keeping up the animal heat.

"Every one is familiar with the fact, that if he labors hard, especially in cold weather, he requires more food than with the same amount of exertion in warm weather, and that if he is hungry at such a time, and deprived of food, he soon begins to suffer from cold; this is because he needs a fresh supply of material to burn in the lung for the purpose of keeping up his vital warmth. Every farmer knows, or ought to know, that if his animals in winter are kept warm, and sheltered, they do better than those that are exposed in the open air to the cold. This is because in the latter case, a large part of the food which would otherwise have gone toward fattening the animal, is used up in the increased respiration necessary to keep him warm.

"It is worthy of notice, that in this grain, which if taken in fair marketable condition, there is according to the table, about ten pounds of water in each one hundred of grain. New wheat frequently contains from twelve to sixteen pounds in one hundred.

"I may here say a few words as to the various practices which are followed in cutting wheat. If allowed to become dead ripe in the field, a considerable portion of its starch and sugar is changed to epidermis, or woody fibre, that is the skin. The grain will then yield more bran, and less fine flour, than it would have done if cut ten days or a fortnight earlier. The result of many careful experiments has shown that when cut at about the above time before entire ripeness, the grain is heavier, more plump, and actually measures a greater bulk. The skin is thinner than it would have been if allowed to stand, for the causes mentioned above, and therefore more fine flour is obtained to the bushel.

"The same reasoning applies to the straw. It is well known that if wheat be mown and fed to stock while green, even with heads cut off, it is an excellent fodder; and it is equally well know that if allowed to stand in the field till the grain is ripe, the straw consits of little but dry indigestible woody fibre. Now the same change takes place, to a certain extent, in the straw, as in the grain; it also contains some gum, sugar, &c., and is therefore nutritious while green, but as it ripens, nearly all of these are converted into woody fibre, in the manner that has been mentioned.

"By cutting the grain, then, before it is quite ripe, a double object is gained; its own quality is improved, and the straw when cut up with hay, &c., is readily eaten by stock, and has really some nutritive properties.

"We all know that it is the *grain* which is sold and carried away from most farms, the *straw* in one way and another, usually getting back to the land. It is then clearly to the composition of the grain that we must look for an explanation of our difficulties, in attempting to restore our exhausted land to fertility. What was the substance which was found to be most abundant in the ash of this part?—all will remember that it was phosphoric acid. This is one of the least abundant substances in the soil, and is, therefore, likely, under the demand upon it for the formation of the grain, to be soonest exhausted. Ordinary manures contain phosphates, but the great bulk of them is straw, which is from the Table, not rich in phosphoric acid. *There* is a special deficiency in the soil, a common manure does not contain enough of the particular substance needed to supply it in sufficient quantity for the wants of the crop. Much more must be present than the plant actually needs, in order that it may be obtained with facility.

"On all worn out or failing wheat lands, the experiment of adding phosphates, may be tried with great probability of success; that is, some combination of phosphoric acid in addition to half or two-thirds the usual allowance of common manures. The cheapest and most convenient source of phosphoric acid for farm purposes, is found in bones, which consist in great part of phosphate of lime. Two or three bushels of these, dissolved in sulphuric acid, or in place of this seven or eight bushels of bone dust, or ground bones, will be an ample application for an acre; it is a cheap remedy, and one that, as all can now see for themselves, can be tried with strong probability of success. Guano, where it can be had, is also an excellent special manure; it is to be used at the rate of about two hundred weight per acre, with half the usual dressing of barnyard manure. Good guano contains about one-third of its weight of phosphate of lime, and some samples much more than that.

"It is to be observed that I do not recommend phosphates as a specific in all cases; the defect may in some instances be of another character entirely, but I do say for the larger portion of our land they will be found remarkably efficacious."

Planting Fruit Trees, &c., in Virginia.

The season is rapidly approaching for planting fruit trees, shade trees, and shrubbery in general, and we take advantage of the occasion to address a few words of exhortation, caution and warning to our country readers. We rejoice to know that far more interest is felt among our farmers in this connection now than formerly. They are waking up to the importance of planting orchards and beautifying the homestead, and we sincerely desire to do somewhat to increase their zeal in this good work, and to give it proper direction.

Every farmer, be his means ever so large or little, ought to have his farm abundantly stocked with the choicest fruit trees, and will find every such tree a source of both profit and pleasure. The large demand for fruits of every kind in our large cities, insures a profit to the fruit raiser, and we need hardly remind our readers of the pleasures which are dependent upon the products of the orchard. Every family in the country knows something of this, and many sigh for enjoyments which are denied to them by the stinginess or shortsightedness of the head of the family. A good supply of apples for winter use, is no mean item in the provision of every household, wanting which nothing can be substituted that will meet the wants and wishes of the family.

The first cost of a good orchard is small. Nurserymen in all parts of the country are raising large supplies of trees to meet the increasing wants of the farming community, and as well for the sake of heavy sales as to promote the cultivation of fruits, these trees are offered at very low prices. Twenty or thirty dollars will buy a hundred of the best fruit trees, and the additional cost of carriage and planting is hardly worth reckoning. Who would grudge the payment of so small a sum, when so much is to be gained by the expenditure? What Virginia farmer can plead inability, as a reason for not having an orchard, when the lack can be supplied at so small a cost? Very few we apprehend can be found who are not abundantly able to buy a few hundred trees, to be planted at some convenient place upon the farm, and we urgently advise all our readers who are without orchards, to make immediate arrangements to supply themselves with trees.

But even those who are raising fruit, ought by no means to rest contented with what they have done already. Fruit trees, like forest trees, are subject to decay, and in the progress of years, orchards die out, unless they are constantly supplied with new trees. That is according to the course of nature, and the true policy for the farmer is to plant trees from year to year and every year, so that as one tree attains its maximum and dies, there may be another, young and vigorous, to fill its place. From the neglect of this prudential arrangement, we have known farmers to find themselves at the end of the year entirely without fruit-bearing trees in their orchards. Every man should plant a few trees every year that he lives and cultivates a farm.

Whether making a new orchard or replenishing an old one, be sure of one thing, that none but the best trees are planted. And by the best trees, we mean not only that they shall be of the best variety of fruit trees known, but also that of the variety there be selected healthy, thrifty trees, which promise well when planted in the orchard. It is always true economy to buy the best, even, if the original cost is more. The best plough, the best harrow, the best threshing machine, the best reaper, is cheaper at a high price than a more indifferent article, which costs less money, and the same is true of whatever a man has to buy. Nothing is gained by the purchase of an inferior article at a low price, when a superior article is to be had even at a somewhat higher prime cost. This is eminently true of every description of fruit tree, as is well attested by the universal experience of all fruit growers. Many a man has repented of the penny wise and pound foolish policy which led him to plant in his orchard worthless trees because they cost something less than good trees would cost.—*Virginia Index.*

TO COOK BEEFSTEAK.—A very good way for cooking beefsteak is to take slices of beef, hack it with a knife instead of pounding, and then lay it in a spider, add pepper and salt, turn and press it while cooking. When done, lay the meet on a platter. Add butter to the gravy, a little flour and water, stir it until it thickens and pour over the meat. This is better than broiling, as it saves the juice and flavor of the meat.

From the Richmond Enquirer.

Richmond.

Richmond is the largest city in Virginia, and we believe one of the most beautiful in the Union. The situation of the city, and the scenery surround it, combine, in a high degree, the elements of grandeur and beauty. The river, winding among verdant hills, which rise with graceful swells and undulations, is interrupted by numerous islands and granite rocks, among which it tumbles and foams for a distance of several miles. The city is built on seven hills, the largest of which are Shockoe and Church Hills, which are separated by Shockoe Creek. It covers an area of about three miles long and one mile wide. The Capitol and other public buildings are situated on Shockoe Hill, the top of which is an elevated plain on the West side of Shockoe Creek. The Capitol stands on the contre of a public square of about eight acres, is adorned with a portico of Ionic columns, and contains a marble statue of Washington by Houdon, taken from life, which is considered a perfect likeness. The Governor's mansion is situated on the East side of the Capitol Square. Northward of the Capitol is the colossal equestrian statute of Washington by Crawford, elevated upon a granite monument of hexagonal form, resting upon a circular base. At each corner of the hexagon is a small pedestal, upon two of which stand the statues of Jefferson and Henry; the four remaining are to be occupied by statues of Mason, Nelson, Lewis and Marshall. The Square grounds are artistically laid out, and adorned with trees, shrubbery and fountains. On the four sides fronting the Square, are the City Hall; the First Presbyterian church; St. Paul's Church; Mechanics' Institute; Custom House: Goddin's Hall—all elegant and costly buildings, representing as many different styles of architecture. The intermediate lots are occupied by the Central and Powhatan Hotels, offices and beautiful modern dwellings.

The other public buildings are thirty-three churches of different denominations, and two others in progress of building (and an effort now making to raise funds to build two more); three Jewish Synagogues; a Medical College, Female Institute, Orphan Asylum, Masonic, Odd-Fellows and Temperance Halls; a State and a County Court House, Jail, Poor House, Hospital, Theatre, four bank buildings, two market houses, and thee public halls owned by private individuals or associations; a State Armory 320 feet long by 280 feet wide, and a Penitentiary. There are sixteen periodicals, daily, weekly and monthly; thirty-seven private and public schools of various grades; seventeen societies for the promotion of religion, such as Bible, tract and missionary; five public charitable institutions; eight divisions of Sons of Temperance; eleven Masonic lodges; nine lodges of the Independent Order of Odd-Fellows; seven German Societies, musical, beneficial, &c.; fourteen various public institutions and societies, such as the Board of Trade, Virginia Historical Society, Mechanics' Institute, School of Design, Medical, Colonization, Agricultural, Mechanic's socities, &c., &c.; three public libraries; Water Works and Gas Works.

Richmond possesses an immense water power derived from the James river, which, from the commencement of the rapids five miles above the city, descends 116 feet to tide level. By the James river and the Kanawha Canal, on the North-side of the river, and a canal owned by the corporation of Manchester, on the South-side, this power is made available at a very moderate rate, and is now used by extensive Flour Mills, Cotton Factories, Rolling Mills, Iron Works, &c., &c., leaving power and territory sufficient for the accommodation of an increase of a thousand fold upon the machinery in present use.

The population of Richmond is variously estimated from 42,000 to 60,000. Our estimate is:

Whites, ...	30,000
Blacks, ...	15,000
Total, ...	45,000

This estimate includes the suburbs—a large portion of which are *outside* of the city corporation.

In 1858, the assessed value of real estate, within the corporate limits, amounted to

	$18,423,348
Assessed value of personal property within the corporate limits, ...	9,876,371
Estimated value of real estate outside of the corporate limits,	4,000,000
Carried forward, . .	$32,299,719

Brought forward, . .	$32,299,719
Estimated value of personal property outside of the corporate limits, ...	1,000,000
Estimated value of real estate belonging to the U. States and State Governments, and the corporation property and State stock held by citizens, exempt from taxation, . .	6,859,000
Estimated value of slaves, . .	7,644,000
Showing the total value of real and personal property of Richmond to be . . .	$47,802,719

The above estimates do not include the value of the various manufacturing establishments of tobacco, flour, cotton, iron, &c., owned and managed in Richmond, but located in Manchester, on the South-side of the river, and located on the Canal above the suburbs; nor does it include several millions of dollars invested by citizens of Richmond in Western lands, cotton and sugar plantations in the South, tobacco factories in the West, and in various other ways out of the city, which, added to the above, would swell the sum to the amount of not less than fifty-five millions, and showing a wealth, in proportion to the white population, greater, probably, than in any city of its size, in the United States.

The employments of our population, with the capital invested, and gross products, as ascertained last year by us upon the most minute and careful examination and enquiry, we found to be

MERCHANDISING, including principals, clerks, &c., 2,284 persons.

Value of stores and warehouses,	$3,962,800
Amount of current cash capital,	6,000,000
Amount of sales, ...	37,142,286

In ascertaining the sales of merchandise, we excluded all re-sales, as far as could be done, intending to estimate but a single sale, no matter how often an article might have changed hands.

MANUFACTURES, including Principals, Clerks and Operatives, 11,832 persons.

Value of tools and machinery,	$1,822,193
Value of real estate used in,	4,641,270
Amount of current cash capital,	6,000,000
Value of product, ...	19,520,896

The number of the various mechanical and manufacturing establishments is over 500, comprising 91 different *kinds*.

There are employed as Auctioneers and Agents, with their Clerks, 133 persons.

Value of real estate used, . .	$116,000
Amount of their business, . .	8,236,042
Current cash capital, ...	1,000,000

HOTELS and BOARDING HOUSES, 477 persons.

Real estate used, ...	$364,000
Amount of gross income, . . .	559,000

INDUSTRIAL—such as livery stables, omnibuses, wagons, drays, carts, &c., 740 persons.

Invested in real and personal property, ...	$465,080
Earnings, ...	599,101

PROFESSIONAL.

Ministers of the Gospel, .	35
Teachers and assistants, .	85
Physicians, ...	73
Lawyers, ...	82
Dentists, ...	12
Total, ...	287

Value of Libraries, ...	$139,900
Value of Real estate used, . .	310,000
Estimated income, ...	394,450

OTHER EMPLOYMENTS.

Those not included in any of the classes named before, are

Bank officers and clerks, Exchange brokers and clerks, Insurance officers and clerks, Railway and canal officers and clerks, Officers of city government, Inspectors of tobacco, flour, lime, lumber, fish, plaster, &c., &c., including the laborers employed by them, numbering 426 persons.

Value of real estate, ...	$150,000
Estimated income, ...	270,807

GENERAL RECAPITULATION OF THE EMPLOYMENTS, ETC.

	No. of persons.	Tools machinery & real estate.	Value of produce.
Merchandising,	2,384	3,962,800	37,142,286
Current cash capital,		6,000,000	
Manufacturing,	11,832	6,463,463	19,520,896
Current cash capital,		6,000,000	
Auctioneers, &c.,	133	116,000	8,236,042
Current cash capital,		1,000,000	
Hotels and boarding houses,	477	364,000	559,000
Industrial,	740	465,800	599,101
Professional,	287	449,900	394,450
Other employments,	426	150,000	270,807
Total persons,	16,275		
Total value tools, machinery and real estate,		$24,971,963	
Total am't of business in 12 months,			$66,722,582

From the Southern Field and Fireside.

General Washington, the Model Farmer.

We have the satisfaction of laying before the readers of the *Southern Field and Fireside*, a letter never before published, of that great man, who was "first in peace, first in war, and first in the hearts of his countrymen."

For this privilege we are indebted to the courtesy of Mr. Thomas Gardiner, Bay Street, Augusta, who has the original in the bold, clear and legible autograph of the immortal author. It was given to the present owner, who holds it in priceless value by his friend, the late H. B. Gwathmey, Esq., who married a daughter of Mr. Howell Lewis, the nephew of General Washington, to whom it is addressed. Mr. Lewis was at that time a young man, and had the charge of his uncle's extensive and well managed farm at Mt. Vernon.

We publish this letter, not to gratify a prurient curiosity as to the "inner life" of Washington the farmer, but for the salutary and most useful lesson it teaches. It is a volume of valuable thought and instruction to the agriculturists of the South. Every planter and farmer should read it. He should read, mark, and inwardly digest. It discloses the secret of Washington's great success in that peaceful and noble calling in which he so much delighted. It shows system, a lucid order, close economy, and accuracy of accounts, even to the minutest things. It shows a desire to improve on past ideas by careful experiments. It shows tireless vigilance in supervising each department of business, guarding against neglect and waste, and holding each person in his employment to a just responsibility.

This letter was written while Washington was President, and at Philadelphia, immersed in affairs of State. How marvellous that then and there, with all the cares of the Young Republic on his mind, at this most exciting period in the world's history he should have found time for such close and skillful attention to his farming operations!

Men who thus understand the value of time, of method, of accuracy—men who truly appreciate the importance of minute attention to business, have in them the sure elements of success in all their aims. They are the born rulers of the world.

PHILADELPHIA, Aug. 18th, 1793.

Dear Sir:—Your letter of the 14th inst., and enclosures, came duly to hand.

I am glad to hear you had a fine rain on the Thursday preceding the date of your letter, even if the corn should receive no benefit from it, because it would put the ground in good condition for the reception of wheat. I hope it was followed by another good rain on Wednesday night last. At this place it rained the whole night.

I want to make an experiment with respect to taking the tops from corn before the usual time. I know that if the tops of a whole field were taken off before the dust has fallen, so as to impregnate the grain, that there will be *no* corn; but as soon as this function is performed, the tops, in my opinion, serve only to participate in the nutriment which otherwise would be more abundant for what remained. I believe, also, as the dust from the tassel impregnates equally with its own; *all* the corn (through the tubes of the silk) it falls upon, that if every other row, throughout a whole field, was deprived of the tops, the corn notwithstanding, would be equally good; and this is the experiment (although it is late for it) that I want to have made. Tell Mr. Crow, therefore, that it is my desire that he would immediately cut the tops from every other row of corn in No. 5, to the amount of twenty, beginning on the side next to No. 2, by the barn. Let the first row retain the tops—the second, 4, 6, and so alternately, to the 40th to lose them. He need not go beyond the old ditch which formerly divided the fields. Particular care must be taken to cut the tops above the second joint, that is, above the one from where the corn proceeds. Experiments of this sort are easily made, and without risk or expense, and the result may be important. I do not mean that the blades are also to be taken off, for this might expose the stalk to the sun, stop the circulation of the juice, and of course injure the grain.

What arrangement have the overseers made for exchanging their wheat, and of kinds does each sow agreeably to my former directions to them? The barley from hence has been delayed beyond my expectation—the vessel by which I intended to have sent it, having sailed sooner than was expected. I do not suppose now it can go earlier than in the Ellwood. But as soon as it is received, it must be sown, in order to give it an equal chance in point of season. Whether to begin on the center side of the fields which are sowing with wheat at the time of its arrival or otherwise, I scarcely know, at this distance, how to direct. I would wish to have neither better or worse ground, than what is allowed for wheat, and it would appear odd to have it in the middle of a field of grain. The overseers, knowing what my design is, must dispose of it in the best manner they can to answer it.

Mr. Lear insits upon it, that he put the clover seed (in a cask containing about seven bushels) into the store himself, on the left hand of the door. If it is not found there, you may tell Mr. Butler I shall look to him for the value of it, unless he can discover what has gone with it. The reason I had it put into the store was for safety; and he will find, by the written instructions I left with him, that the key of that house was not to remain in his possession longer than whilst he was in the act of giving things out. If the clover seed then is not there, Butler must have disposed of them *himself*, or by retaining the key in his possession, contrary to my orders, have given the roguish people about the house an opportunity to come at them; in which case, as I have observed in a former letter, there can be no doubt of their taking everything else that was saleable. If no clover seed was gathered before you found the rake or comb, were not both seed and clover lost by standing too long? And why this, ask Butler, when both are so essential to my wants. Is the clover, which, by the report, is brought from the oat field at Dogue Run, that which was sown last spring? If so, was it rank enough to cut?

I do, in earnest terms, enjoin it upon you to see that the hay is used with the greatest economy at the Mansion—and particularly to guard against Mrs. Washington's Charles and her boy in the stable, both of whom are impudent and self-willed, and care not how extravagant they feed, or even waste, for I have caught the boy several times littering his horses with hay. Except her blind horse, (which may be endangered by running at large) I see no sort of necessity there is for feeding the others with either grain or hay, when they are not used, or any other horse that is at liberty and able to provide for itself; those that are kept constantly in the house, constantly at work, or under the saddle must be fed, or they would perish. I can plainly perceive that in a little time, (after saving what oats I want for seed another year) there will be nothing either for my negroes or horses to eat without buying, which will neither comport with my interest or inclination. By Stuart's report, I find he still continues to feed horses with corn instead of cut oats, as I directed. What two saddle horses are those that stand in the Mansion House Report? I know of none but the one which Mr. Whitting used to ride.

Has Mr. Stuart received any aid in getting in his wheat? and have you, as I directed some time ago, furnished him with plow beasts in place of those which he says have colts, and are unable to work; and the other two, one of which, according to his account, cannot, and the other will not work? Those which cannot, or will not work, had better be turned out for breeders and their places supplied out of the brood mares—and those which have colts ought to be favored. As to having their hearts broken, I do not wonder at it, considering how they are treated, and I fear rode of nights.

I see by the report respecting the ditchers, that one of them is working on Union Farm, in the place of Cupid; but no mention is made of the latter, whether sick, absent or dead. Consider always that these reports are intended for information, and ought, therefore, to be plain and correct; one part should always correspond with another part. In the Mansion House Report you make Godfrey sick six days, (which is the whole week,) and yet he appears to be engaged in business some part of the week. I mention these matters not with a view to find fault, but to show you that advantage of correctness; and as a young man, just advancing into life and business, to impress you with the propriety and importance of giving attention and doing whatever you undertake well.

How do the potatoes at the Mansion House look? Let the ground be kept clean and in fine order—that is well pulverized, not only at top, but to a sufficient depth for grass.

Unless Isaac is engaged about things, the execution of which cannot be delayed, order him, and whoever is with him, to join Thos. Green, and the whole of them to stick to the barn at Douge Run until it is completed. It appears to me that the whole or greater part of the time of these people, is employed about one nonsensical job or another, which is the very thing Green is delighted with, as they afford him a pretext to be idle or to be employed in matters which more immediately relate to himself. I wish this may not be the case also with Isaac, as I find he is very desirous of getting by himself always When I said the whole were to be employed at the new barn at Dogue Run, I did not mean to leave the dormant windows in the stable (both back and front) unfinished, as they have been begun, which would not have been the case if I could have conceived they would have taken half, or even a quarter of the time they have. In front of the stable I ordered two, one on each side of the pediment, dividing the space equally between the latter and the ends of the house.

Davis, any more than the carpenters, ought not to be taken from the above work for every little trifling that might as well be done by that lazy scoundrel, Charles, who might as well be employed in white-washing, painting, or putting up bedsteads, as to take Green or him for these purposes. Idleness will be his ruin, for I have no conception of his employing himself otherwise than idly; and when this is the case, besides the bad example it sets to others, he will be in mischief or making a disturbance in the family.

I do not recollect telling you in any of my letters, that the Ream of writing paper which went by the Ellwood, was for the purpose of supplying the overseers, &c., with paper to make their reports on. Give each, (if you have not already done it) a quire and let them know that it is to be applied to this purpose only.

I did not expect an accurate account of the hogs from the overseers at this time; but if they do not keep a pretty good eye to them themselves, I shall have but a flemish account of them when they are called for as porkers.

I see by the mill report, for the last week, 23 bushels of meal was brought to the Mansion House, when the usual quantity for that place is 10 bushels. Why was this done? If 30 bushels was brought them it would, I am persuaded, be consumed, or otherwise disposed of in the week.

Your Aunt and all here are well, and I am your affectionate uncle.

G. WASHINGTON.

Mr. H. Lewis.

From All the Year Round.

Farming by Steam.

The poets of modern agriculture, the happy souls who farm a little, write a little, and talk a great deal at semi-agricultural, semi-scientific, and wholly social gatherings, are crying out in joyful tones with more fervour than ever—for it is not the first time—t at the doom of the plow has been sealed, and that in five or six years those Clydesdale and Suffolk two year old colts that now sell readily for 50*l.*, will be sold for 20*l.*, and, as for the old harry-legged breeds, they will be to be had for the asking! The more sober, like most of those who live to learn and live by learning, can't go quite so far or so fast. We remember that after more than twenty years' experience the broadcast sheet and the flail still even in England find usage and defenders within sight of the drill and the threshing machine, and that in Scotland crack farmers insist on doubling the work of their men, and putting ten per c nt. of it on their horses, because they won't condescend to examine the value of the Southron-invented Bedford plow. But, although believing that as railroads have not in thirty years closed highways or filled up canals, it is not likely that steam power will ever entirely banish horse power, or even horse-drawn implements from our fields, we must with pleasure admit that 1859 has seen a scratch mad on mother earth by the steam cultivation that will in future years be turned to as the mark of a practical advance in a theory that had very long been under the harrows of projectors and inventors.

A thick volume might be filled with the guesses that, in the shape of projects or patents, have preceded almost every really useful invention. The reaping machine may be traced back to the time of the Gauls, wheeled plows are to be found depicted in Saxon manuscripts, and something like Crosskill's clod-crusher is described as a home-made instrument one hundred years before the Royal Agricultural Society gave the Yorkshireman the clod-crushing gold medal. The French amuse themselves with setting against the triumph of Watt's steam-engine the ingenious hints of Salomon de Caux, and have written a play, in which the Marquis of Worcester, who was not then born, is made to converse with and rob of his invention the maniac philosopher. Even of the electric telegraph faint traces are to be found in some ancient philosophical manual.

Steam-cultivation is one of those long-sought, although only recently caught, arrangements. For two hundred years projectors and inventors in two hundred patents have been guessing without success at the agricultural steam truth; but it does not seem that any attempt was made to cultivate land by steam power on a scale of importance, or in a continuous manner, until 1832, when Mr. Heathcote, of Tiverton, with Mr. Josiah Parks for his engineer, commenced reclaiming Chatmoss by draining and steam plowing. The reclaiming did not pay, and the steam plowing, although continued for two or three years with great labour and ingenuity, did not answer, but the work indirectly led to the construction of the Parkesian theory of deep drainage, by which agricultural England has been revolutionized, and at least doubled in productive powers. The system adopted by Mr. Heathcote and Mr. Parkes of dragging implements by ropes attached to and revolved by a stationary steam-engine, is the only system which, up to the present time, has been found to answer, although the arrangement of the details and the materials of the ropes have been modified and improved.

In the following twenty-five years sixteen patents were taken out for cultivation by steam power, none of which were carried into execution, and in the last ten years nearly one hundred patents have been provisionally registered, and more than half that number specified. But out of this long array, in March, 1859, not more than six were before the agricultural public as at work, and not more than three prepared to make and sell their patented machinery. But intermediately, two noblemen, Lord Willoughby D'Eresby, in Warwickshire, and the Marquis of Tweedale, in Scotland, had expended large sums unprofitably in endeavouring to cultivate by steam traction.

In 1848, the celebrated Talpa, in his Chronicles of a Clay Farm, one of the most charming books ever devoted to agricultural disquisitions, suggested that the problem of steam cultivation should be sought, not in the traction or populsion of the established implements of the farm, but in a rotatory machine, which should dig as it travelled around, and propel, or, as it were, hoe itself forward "with a sort of lobster's tail." On this ingenious idea a great number of inventors have been at work ever since, some at vast expense, but up to the present time not one successfully in an agricultural point of view. On one, the best of the attempts to realize Talpa's poetical notion of perfect steam cultivation, and which often worked admirably for an hour or two, more than ten thonsand pounds were expended; bnt it could never be made to work withont the hourly and costly attention of an army of mechanics, and, in spite of their aid, it continually broke down. If it were strong it was too heavy; if it were light, it was too weak; and there the rotatory locomotive theory of steam cultivation rests at present.

By a curious coincidence with the story of the origin of modern agricultural draining, told in the Quarterly Review of April, 1858, the most profitable system of steam cultivation was suggested by an attempt to substitute machinery for manual labour in laying draining tiles. The inventor, Mr. John Fowler, produced before the Royal Agricultural Society, at Gloucester, in 1858, a contrivance for forcing a mole plow, drawn by a team of horses, through the ground at four feet depth, followed by a rope on which a line of drain tiles were strung. Step by step, he substituted a wire rope (a modern invention) for hemp, and a portable steam-engine for horses, but when in 1855, at Carlisle, he had succeeded in laying pipe tiles with great accuracy in soils tolerably level and free from stones, he began, we imagine, to suspect that the great elements of success in machinery—that is, to supersede manual labour, speed, and economy—were wanting. Hence he was induced to moderate his ambition, and be content to plow a few inches instead of burrowing three or four feet; and there, after four years of enormously costly experiments, he has achieved the measure of success we shall presently relate. But he had a successful precursor in a self-taught mechanic —as far as he is a mechanic—and a real farmar, in the person of a gentleman bearing the not remarkable name of Smith, and therefore now distinguished by the title of his farm, as Smith of Wolston; a name which, in three years, has become deservedly famous throughout the English-speaking agricultural world.

The general effort of the agricultural improvements of the last twenty years has been to increase the *pace* at which agricultural operations are executed. The first change was to substitute fallow crops, such as roots, for instance, for the absolute barrenness by which land was formerly rested after an exhausting crop—a plan which is still all but universal among the peasant proprietors and métayers of France and South Germany. The second change consisted in making strenuous efforts to execute in autumn a greater part of the cultivation, which until recently it was the custom with the great majority of farmers to execute in spring. It was observed that weeds brought to the surface in the autumn naturally died more easily than in the spring, while the subsoil brought to the surface, and tough clay under any circumstances, was mellowed and ripened by winter frosts and winds.

Mr. Smith of Wolston, was one of the many converts to the system of autumnal cultivation, and in studying the best means of carrying it out he came to the conclusion that the plow which buried the weeds, and left a large per centage to grow again in the spring, was a mistake, and that an instrument which would more nearly approach the action of the spade was the right implement. With this view he invented his subsoil plow, which stirs without turning over the soil, and his cultivator with curved tines which breaks up the topsoil without reversing it.

But every farmer who has turned his attention to breaking up strong soils for autumnal cultivation has found himself beaten by the want of power to move the most useful kind of implements, and by want of pace to execute his work during and immediately after harvest before the autumn rains set in. A farmer holding twelve hundred acres of land in two farms, of which four hundred acres are arable land, in a stiff clay district, writes us on th's subject:—"To get these worked up, I should require the power of seventy horses from the middle of August to the middle of September, but fifteen would do all my work for the rest of the year!"

The Farmer of Wolston tells us, in his letter to B. Disraeli, M. P., "that a report of the Royal Agricultural Society on implements called his attention to the resources of steam power." At the Carlisle Show of 1855 he was awakened to the power of steam—ordered a steam-engine from Messrs. Ransome and an iron rope and tackle from Mr. Fowler, whose reputation had been established by his tile-laying machinery. Soon afterwards, arose fierce disputes as to priority of invention or adaptation between these two gentlemen; but to the public there is no interest in disputes, the merits of which, as far as the mechanical part of the question goes, few if any can understand or care to understand. As in the old gold and silver shield story, the Farmer and the Fowler are both right, and have separate and not opposing merits.

One certain fact is, that the Man of Wolston first saw and acted on his sound conclusion, that it would be much more easy, simple, and economical, to apply steam power to "cultivators and grubbers," which, to use his own expressive phrase, "smashed up the soil" and brought the weeds to the surface, than the old system of plows, which turn over the soil and bury the weeds; and in 1855-6 he successfully applied this system to the cultivation of about one hundred acres of his own farm.

At the Chelmsford Show, in 1856, Mr. Fowler produced his steam plow, which was strictly a plow, being a frame on which six or eight shares were arranged, of which half were at work while the others were alternately carried in front in the air. This he worked with such a measure of success on Mr. Fisher Hobb's farm, that Mr. Hudson, the celebrated agriculturist of Castlacre, Norfolk, and a cautious man, there and then declared himself a convert to steam cultivation, and offered to cont act for having a good many acres plowed if a machine were sent.

But, although ever since that day Mr. Fowler's steam plow has been constantly before the public, it was not until the beginning of this year, and until he had become the possessor of some score of patents, and until more than twenty thousand pounds had been expended, that he was able to make a decided stand, and announce that he was ready to take any number of orders at a price that farmers could afford to pay.

At Salisbury, in 1857, when the Royal Agricultural Society repeated their offer of a prize of 500*l.* for a steam-plow, Mr. Smith of Wolston, was excluded from the competition by a mistake in the conditions, (whether intentional or not we are not able to say,) which made it essential that the implement should *turn the soil over*, while, as already observed, it is an essential feature of the Wolston system that the soil should be thoroughly "*stirred and smashed up*"—not turned over.

The ground for the Salisbury trial, was not favourable to steam cultivation. Fowler's plow alone, of three competitors, did creditable work: so creditable that the judges and stewards concurred in recommending that a part of the prize-money should be awarded to it. But this recommendation was rejected by a majority of the council. And certainly, up to that date, Mr. Fowler had not produced a commercially useful machine—that is to say, a machine that could be trusted to work on without breaking down, that could be easily moved and set to work, and that could be sold at a price within the means of first-class rent-paying tenant farmers.

In February, 1858, a paper was read before the Society of Arts by a gentleman of well-deserved reputation as a contributor of Prize Essays to the Journal of the Royal Agricultural Society, which will become a curious bit of history in a few years; for, the author, wild and wide of the reality of the subject notices in succession, not only the successful Wolston and since successful Fowler, systems, but half a dozen others, and praises and encourages almost all: even such mechanical absurdities as the Elephantine Traction Machine, which wears itself out hourly as it travels: and a scheme for bottling up compressed air and letting out from mains and elastic tubes to be laid down under and over a farm! and he concludes by recommending an entirely new implement, with a new "cutting and inverting movement," something like a barrel armed with sharp discs driven endways. In fact, the idea of an uninvented machine—a sort of mechanical nightmare to be propelled by an impossible motion!

At the Chester Exhibition of the Royal Agricultural Society, in July of the same year, Messrs. Howard exhibited Mr. Smith's machinery manufactured by them, and Mr. Fowler his latest modification of his steam-plow. After a serious trial the prize of 500*l.* was awarded to the latter, and the large gold medal to the former. It was considered by the engineers that Fowler had a better mechanical arrangement, and by the agricultural judges that he did at one operation what Smith did at two.

Smith's system, as exhibited by Messrs. Howard at Chester, consisted of two operations. The first with a strong speed-tined cultivator of a sort of anchor shape, which penetrates the ground six or seven inches, tears it up, stirring much deeper than it tears. Secondly, with a larger instrument of the same kind, which travelling in a transverse direction at the same depth, clears away any portions surrounded by the first, and reverses the whole topsoil, exposing a rough, unequal surface to the action of the atmosphere; the two operations being completed at the rate of three and a half acres per day.

The comparative position of these rival cultivators at the close of 1858 was this: Mr. Fowler with a costly and ponderous arrangement of machinery, doing very good and rapid work. had won prizes from the Highland, the West of England, the Irish, the Yorkshire, and the English Agricultural Societies in the order named.

Mr. Smith, with an ordinary portable steam-engine, a wire rope, and machinery that cost some 200*l.*, had cultivated his own farm, and reduced it to a tilth and degree of fertility that excited universal admiration, and had sold some twenty or thirty sets of his tackle to purchasers who also worked it successfully: especially in Worcestershire, Staffordshire, Beds and Bucks.

Thus, while by a series of changes and improvements Mr. Fowler contrived to obtain a greater amount of power and work out of a steam-engine and rope drawing a set of plows, better arranged than any of the previous experimenters in the same direction, the Wolston Farmer had better appreciated the capabilities of steam cultivation, and, with the assistance of the most eminent plow-maker of the day, had produced a set of steam cultivating implements admirably calculated to carry out a system which, for distinction, we should like to name Wolstonizing.

"On the Wolston Farm one hundred and ten acres of stiff clay arable land, by drainage and Mr. Smith's peculiar yet simple mode of cultivation, has become as fine and deep in tilth as a market garden, and requires just as little trouble to keep it in a clean and healthy condition." A writer in Bell's Messenger describes a field of ten acres at Wolston from which a tenth crop was about to be taken, in 1858–9, *without fallow*. "For five years this field had never been turned over on the old principle of plowing."

Agricultural public opinion having been thus ripened, a great step in advance was made the other day by Mr. Fowler, which reduced the weight of his apparatus, exclusive of the steam-engine, from three tons and a half to about twelve hundred weight, and the price from about 450*l.* to less than 250*l.* for a set of tackle and implements capable of performing every process of cultivation on arable soil, still retaining everything that was valuable in his successive improvements. If this be so—and we believe it is—then we may expect to see steam cultivation, within a very few years, introduced on every farm of deep retentive soil which now possesses a portable steam-engine, and on hundreds of farms to which it will make its way, bringing with it the steam-engine and divers other contingent improvements.

The following is an attempt to describe the working of the two systems—a very difficult task without the illustration of diagrams.

Mr. Smith uses an ordinary agricultural portable steam-engine of from eight to ten horse power, which he fixes at one corner of a field, for choice of from ten to twelve acres. In front of the engine is a windlass, or capstan, with two drums, of a peculiar shape, with a coil of wire rope around it; and this rope is led over four anchored pulleys, one at each corner and along each side of the field. The windlass attached to the fly-wheel of the steam-engine by a driving band can be instantaneously driven in either direction. Four different plows, or cultivators, are used, as occasion requires. To the bow of the one in use, two ends of the rope are attached. An engine-driver, a man at the windlass, a plowman, an assistant to shift the pulleys, and a boy, are the staff required. The plow cultivator begins by travelling along the more distant side of the field, between the two anchored pulleys; at the end of the first journey the pulley in front is shifted, the engine is reversed, and in thirty seconds the plow is travelling back; and thus, by alternately shifting, bringing up each of the two most distant anchors, strip by strip the whole field is "smashed up" in parallel lines to the spot where the engine stands.

His plow No. 4 consists of a very strong frame, in which are fixed three subsoil plows, with a pair of wheels in front to guide it, and above the centre another pair to regulate the depth. The shares for breaking up clay soil in autumn are set to work six or eight inches deep (a depth impossible with horse power.) The "points of the shares become imbedded in the subsoil, and the whole mass, nearly a yard wide and six or eight inches deep, is torn from its position, and more or less mingled together, leaving for the most part the weeds or grass which it is desirable to destroy near the surface." An implement of greater breadth and more tines on light and moderately tenacious soils has been made to move more than ten to twelve acres in a day. But for a description of the four Wolston cultivators those further interested must refer to the inventor's own pamphlets and pictures The obvious drawback of the system consists in the loss of power by the friction of the rope along four sides and consequent indirect traction. Common farm labourers have been repeatedly and easily taught the duties of Smith's system of steam cultivation. According to universal testimony, nothing can exceed the quality of the work and the satisfactory result in crops of all kinds.

Mr. Fowler employs a portable steam-engine with a series of drums whose axle is fixed vertically beneath it; a wire rope, passed round the drum of a movable anchor, is stretched across the field to be plowed, and the two ends are made fast to the plow, thus forming an endless rope. In working, the engine and the anchor move along the two headlands in parallel lines, and the plow before described, or any other implement—Mr. Fowler has been converted to the cultivator—moves forwards and backwards between the engine and the anchor by the reversing gear of the engine. It is evident that under this arrangement the action is more direct, less rope is required, and less power lost by friction than in the Wolston system. It is to be regreted that an arrangement has not been made by which Smith's admirable cultivators could be attached to Fowler's steam power; for Smith wisely repudiates plowing, and "takes his stand on cultivation;" and it seems likely that on farms with fields of moderate size, and soil of not the most tenacious character, the Wolstonizing plan will continue to be preferred. The results of Fowler's cultivation before he had succeeded in reducing the cost and weight of his apparatus to a portable and saleable standard, is well described in Morton's Farmer's Almanac, in a report of the Highland Society's trial at Stirling, in November, 1857: "The trenching plow (Cotgreave's) excited the greatest enthusiasm. Everybody knows the difficulty and expense of plowing two furrows deep, and the time and labour necessary to reduce enormous furrow slices into a comminuted state. But this implement drawn at a speed of three miles an hour, turned down not a tough whole slice, but one of loose mould into the trench left by the preceding bout, and lifted up from an average depth of twelve and a half inches, and spread upon the top, not heavy, unwieldy masses, but divided and pulverized, a stratum of subsoil, equal to good digging by hand, at one-third or one-fourth the price." Now, in a paper read at the Central Farmers' Club in June, 1857, by Mr. Bond, which had the effect of giving an extraordinary impetus to the practice of autumnal cultivation of clay soils, and indirectly to steam cultivation, he described himself as using a common plow with two horses, followed immediately by a scarifier with six or eight horses, working at harvest time, as soon as the sheaves were shocked in rows, and these two implements went over the land twice: that is to say, they required labour equal to from sixteen to twenty horses to do less than two acres a day: and he added, thus confirming the theory and practice of the Farmer of Wolston: "The common plow is not suitable for autumnal cultivation; it buries the weeds instead of bringing them to the surface."

With these extracts we pause, and sum up with the following elementary information for the benefit of our bread and beef eating non-agricultural readers:

Stiff clay soils were the favourite farms of our forefathers in the days of the rudest agriculture, because they gave good crops in dry favourable seasons, with very little or no manure, and received on the rest of a fallow more quickly than light, or sandy, or chalky soils, for reasons which the chemists of this last quarter of the nineteenth century have discovered. But sheep-treading, root cultivation, or, as it is commonly called, the Norfolk system, brought light and chalk soils into favour, as arable farms and clays were neglected and left to poor farmers. When the Parkesian system of systematic, deep, thorough drainage was completed and established by an almost solitary successful instance of Government interference in a daily bread business (we mean Peel's Drainage Loan,) retentive soils regained a certain degree of favour. With the help of pipe tiles corn could be secured even in wet seasons, and sheep fed where sheep were unknown in the days of shallow bush drains. But retentive clay soils, in spite of systematic drainage, had, and have, a disadvantage which was little felt a hundred years ago, when a farmer could afford to go to sleep for half the year, before "rapid concentrative," or what the French happily call intensive culture, was known. It requires extra horse power to work it; it can scarcely be worked at all when it is damp; and in damp weather the treading of horses' feet on clay does incalculable damage. Modern requirements insist on every acre being continually under crop, or seed, or labour. Clay districts, from their peculiarity, have fewer working days than less retentive soils. Clays, modern experience tells, as shown above, should be cultivated deeply, and in the autumn, as they are neither mellow nor clean in the spring, and the clay farmer who misses his autumn is running after his work all the following year, and never overtakes it.

It is not then necessary to enter into the question affirmed by the Royal Agricultural Society's Judges at Chester, and disputed by some skeptics, that steam cultivation is cheaper than horse labour—although we believe it; but we may rest the success, the triumph, the progress of steam cultivation on the fact that it can do an essential work of deep autumnal cultivation, which no number of horses practically yokable could do at all, with the rapidity peculiar to steam power, and without the enormous disadvantage of the consolidation of trampling horses' feet. Thus the drill saves the dry days of the sowing season, the reaping machine saves the harvest season, the threshing machine saves and supplies the market, and the steam cultivating engine saves the cultivating season and multiplies by six or eight fold the value of every day, dry enough to stir the soil on the old plan at the rate of an acre a day: thus increasing the crops to a degree that it is scarcely safe to state. With that unanswerable conclusion we will conclude content—although inclined to agree with the Farmer of Wolston that on most farms of three hundred acres and upwards, of tolerably level land, a well-applied steam-engine will save one-third of the horse power, and do the work twice as well as horses can do it, even on light land.

A friend inquires, "What about Halkett's Guide system of steam agriculure—the railway farm system?" Why, this only—that it is perfectly practicable, but would cost to apply about one-third more than the fee simple of most farms.

From the Gardener's Monthly.

Fruit Garden.

Either for pleasure or profit, nothing is more interesting than fruit growing; and if what is worth doing at all is worth doing well, it is more particularly so at the hands of the orchardist. As to whether fruit growing will "pay?" that question is very easy of solution. Anything will pay for which there is a demand, and which none of our neighbors can raise cheaper than ourselves. When fruit growing once becomes a regular business, prices will rise and fall with the abundance and scarcity of the crop,—and except in cases of total unproductiveness, it will be the consumer instead of the producer who pays the difference. Will Pear growing pay? is like asking, will the Ice crop pay? More danger, I judge, should be apprehended from its superabundance than its scarcity. Still, we would all rather split on the rock of superabundance, and, with this view, now is the time to prepare for next Spring's operations.

First and foremost, an orchard should be thoroughly underdrained, in order to obtain a moist subsoil—should your trees escape a late frost in a bad season like the last—if the subsoil is dry, the fruit will fall in a drought, or if the fruit does not fall, the leaves will, when the fruit may as well—for as soon as the leaves fall, or in any way become extensively injured, the fruit will be worthless, if it even seems to ripen. Whatever is added to the soil in the shape of manure, should be done as much with the view of affording a moisture-retaining property to it, as of supplying any mineral or gaseous element; heating or excessively stimulating manures are very injurious, especially to the pear, and many failures in its management have originated entirely in this mistake. All fruit trees require a soil which is deep and dry in winter, but cool and retentive of moisture in summer,—and if not so naturally, must be made so, before much success can be hoped for. It "pays" better to have but half an orchard thus well done, than a whole one as we usually see it. Agriculturists now lay down the rule, that "there are few soils not improved by under-draining," to which I will add, "especially for fruit orchards."

When drained, subsoiled, and moderately manured, the ground may be left rough all winter, when it will be lighter in the spring than if smoothed off at once. For an orchard of Pears, Plums, Cherries or Apples, twenty feet apart is a good distance to set the trees, which should be in straight lines. Peaches or Apricots may be planted between these if on a south or warm aspect, as they are there short lived, and will be about done when the others come into bearing; on a north or northwestern aspect, however, especially if the trees are clothed with branches to the ground, they will often live to a great age, but they may be cut away when the others grow. Dwarf Pears are sometimes planted between standards; but these require rather higher culture than orchard trees, and are best grown by themselves. The ground for an orchard, if prepared as above advised, may be sown down after planting next spring with orchard grass. Immediately about the trunk of the trees, the grass should be kept away, the better to guard against harboring the larvæ of borers. Every second year, the orchard under the trees should have a good top dressing of guano or very well rotted manure. I mention this here because it is often recommended to keep an orchard under culture in order to supply manure to the trees. The system I recommended is better.

Established orchards, on thin or impoverished soil, may be renovated in the following manner:—If a tree has been planted, say fifteen years, and attained the size we might expect in that time,—get, say ten feet from the trunk, and dig a circle two feet deep all around it, and fill in with a good compost, the effect the next season will be quite marked. If the tree is older or younger, the distance to start with the circle, from the trunk, will, of course, be proportionate. A top dressing will also be of great assistance, as well as a vigorous pruning out of all weak or stunted branches. Moss and old bark should be also scraped off, and if the trunk and main branches can be washed with a mixture of sulphur and soft soap, much advantage will follow. Old decayed bark, on fruit trees, is always a sign of a want of vigor. When a tree is growing thriftily it cracks this old bark so freely, as to make it easily fall off; but when the tree is weak and enfeebled, the bark often becomes indurated before it has got cracked, and in this state the tree becomes what gardeners call "hide bound," and artificial means must be afforded to aid the tree to recover. In the cherry and plumb trees this is easily done, by making longitudinal incisions through the bark with a sharp knife. In the Peach and Apricot also, I have employed this process with advantage, in spite of learned theories which have attempted to show up the absurdity of the practice.

Sometimes fruit trees are unproductive from other causes than poverty of the soil, or neglect of the orchardist. They often grow too luxuriantly to bear well. In this case root-pruning is very effectual, and is performed in a similar way to that described above, by digging a circle around the tree, except that the circle is made closer to the trunk of the tree. A fifteen year old tree for instance, may be encircled at five feet from the trunk. No rule can be laid down for this. Judgment must be exercised. If cut too close, the tree may be stunted for years, and if too far, it will not be effective. The aim should be to reduce the roots about one-third.

Almost all established orchards should have an annual visit from the pruner at this season. Weak growing trees, or those which have over-borne, will be benefitted by a vigorous application of the pruning knife. Free growing trees, on the other hand, will need only those branches taken out that are likely to cross and interfere with others. Many recommend cutting off large branches in summer, because the wounds heal over at once; but if the wounds are painted, as they should be, no injury will accrue from that source; while the injury to the tree from the sudden loss of a large mass of foliage, will not occur.

In planting fruit trees, the Pear, Apple, and Cherry, invariably do better fall-planted, than when deferred till spring, north of Philadelphia. The Peach, Plum, and Apricot, should not be planted till spring, if not done before the first of November. All fruit trees, when set out, should be vigorously shortened in. Trees should not be planted deep—no deeper than they grew before removal. It is better to draw a mound of soil about them for the winter, to be removed early in spring; it preserves from frost, and throws off superabundant moisture. Dwarf Pears must be set below the Quince stock—and in selecting these, choose those that are budded near the ground—where a long-legged quince stock has to be buried so deep, the tree makes but a poor growth for some seasons afterwards, and is, in other respects, injured. In severe climates, Cherries of very luxuriant growth are liable to be winter-killed. To obviate this, the weaker growing kinds, as the Duke and Morello, and the Mahaleb, are used for stocks to graft them in. This checks their vigor, and renders them hardier. It, however, always keeps them dwarf,—and superior sized fruit is not so probable. Where danger of winter-killing exists, these strong growing kinds should not have a highly manured soil, and where they yet grow very vigorous when young, they may be root-pruned as already described. If they can be got through the first ten years of their life, till they lose their youthful vigor, they will not suffer in severe winters afterwards.

Much attention is now given to small fruits. They who have depended the past year on their orchards, have been driven for fruit to green Tomatoes and Elderberries, and will now plant Currents, Gooseberries, Raspberries, Strawberries, and Blackberries. These can generally be depended on—and near a large city, are always a source of profit.

The three first named like a moist subsoil, and a situation not exposed to drying winds. The Strawberry and Blackberry will do in a dryer soil, and warmer situation. The Blackberry has now become an important fruit, but should not be planted where its creeping roots will be an objection. There are always "odd corners," where such plants become just the required thing to fill with. The Strawberry, Blackberry, and Raspberry, should be protected in winter, north of Philadelphia,—most kinds are hardy enough to stand without this care, but it is better to employ it nevertheless. Strawberries may have leaves or straw litter thrown over them, and a little soil, thrown over to keep the wind from blowing them away. Raspberries and Blackberries should have their last seasons' bearing shoots taken out, the young canes pruned so that three or four of the strongest only are left, and then laid down and covered with soil. To do this without breaking them, dig out a spade full of earth on one side of the hill, and with the heel press the stock over. The inclination will be sufficient to prevent breakage.

Fig trees may be preserved in the same way. Sometimes they are taken entirely up, and placed in a moist cellar, secure from frost.

I cannot close this chapter without the advice to the orchardist, that when he can spare time from any other pressing occupation, his pastime should be to "hunt" insects. Not nearly as much time is spent in the pursuit as there should be. It is not worth while to stop to inquire which is the *best* mode of dealing with them. Employ all modes—every enemy killed is so much gained, and practice will soon show which is the best. Whatever borers may have been permitted to get into the trunks of peaches, plums, apples or quinces, should be at once looked after. Some use a wire, running it down the hole to the end where reposes his grubship; but my favorite plan is to follow him with a jack-knife. The wounds should be afterwards painted well to keep out the wet, till the new bark grows over next year. After they are all got out and painted, oiled canvas, or leather, or brown paper, to be afterwards tarred, should be tied around the trunk, some four inches above the ground, and two or three below; gas tar is preferable. The trees will then be ready for the borer next June, who will hesitate to storm so formidable a defence.

This part of "pomology" is very important, and with each month, as the season arrives for such precautions, much valuable information will be given not generally known, whereby many orchards and trees, now utterly worthless, will be a source, to their owners, both of pleasure and profit.

From the Genesee Farmer.

"On Some Points in Agricultural Science."

Such is the unpretending heading of an able article in the last number of *Silliman's Journal*, from the pen of Prof. S. W. Johnson, of Yale College. It will be recollected that we have frequently alluded to the experiments of Way and Thompson, "On the Power of Soils to absorb Manure." That the soil has the power of absorbing odors, has long been known. Hence we bury garments upon which the fetor of the skunk has fallen; and it is said that the Indians sweeten the carcass of the skunk, and render it fit for eating, by the same simple process. Dogs and foxes bury bones and meat in the ground, and afterwards exhume them in a state of comparative freedom from offensive odors. But by what means these effects were produced, we had, previous to Way's investigations, only very vague conceptions. The absorbent power of the soil, like that of charcoal, was referred "to the surface attraction of porous bodies." Way discovered that it was due to the presence in the soil of double silicates. He found that ordinary soils possess the power of separating from solution in water the different earthy and alkaline substances presented to them in manure. Thus, when solutions of salts of ammonia, or potash, magnesia, &c., were made to filter slowly through a bed of dry soil, five or six inches deep, arranged in a flower-pot, or other suitable vessel, it was observed that the liquid which ran through, no longer contained any of the ammonia or other salt employed. The soil had, in some form or other, retained the alkaline substance, while the water in which it was previously dissolved passed through.

It was also found that the combination between the soil and the alkaline substance was rapid, if not instantaneous, partaking therefore of the nature of the ordinary union between an acid and an alkali.

In the course of his experiments, several different soils were operated upon, and it was found that all soils capable of profitable cultivation possessed the property in question in a greater or less degree.

These double silicates were found to have a strong attraction for ammonia—lime, soda, or potash silicate being decomposed when ammonia in solution is filtered through the soil—the ammonia being retained. But it would appear that the lime silicate alone has the power of attracting ammonia from the air; and hence, perhaps, one of the advantages of liming land.

These important experiments not only opened up a new field for investigation, but materially affected our views in regard to the action of manures. Thus Way found that the ammonia-silicate was much more soluble in water to which a little common salt had been added than in pure water; and he suggested that the effect of salt on some soils might be ascribed not to its furnishing chlorine and sodium to plants, but in increasing the solubility of ammonia in the soil. In the experiments on wheat, at Rothamstead, Mr. Lawes found that though the increase of the crop was, other things being the same, always in proportion to the quantity of ammonia supplied in manure; yet the quantity of nitrogen (ammonia) in the increase of wheat and straw was far less than the quantity of ammonia supplied in the manure; and therefore concluded that ammonia or its elements was evaporated from the wheat plants during their growth. When Way made his important discovery of the formation of ammonia-silicates, he suggested that the large quantity of silica found in the straw of wheat and other cereals, was taken up as an ammonia-silicate—the silica being deposited on the straw and the ammonia evaporated into the atmosphere. Hence the loss of ammonia in growing wheat.

If the fact of the loss of ammonia in growing wheat was admitted, the celebrated "mineral manure theory" of Liebig fell to the ground; and accordingly, in Liebig's Reply to Lawes," he pronounced the experiments of Way, and the opinion she based upon them, "*all self-deception; not reality, but theatre decoration.*"

Prof. Johnson, who translated Liebig's attack on Lawes, from which the above is an extract, and who is therefore familiar with the views of Liebig on this important subject, now bears testimony to the general truth of Way's results. He says: "The recent experiments of Eichhorn have cleared up the discrepancies of Way's investigation, (which is itself one of remarkable interest,) *and have confirmed and explained his facts.*" And again: "These observations of Way and Eichhorn promise to yield the most fruitful results, not only to the theory of chemical geology, as elucidating the formation and alteration of minerals, but also to the science of agriculture. The explanation of the retentive power of soils which Way first proposed, thus acquires an incalculable significance. It is plainly a true explanation, as now relie ed from the constraint of a fixed order of affinities or replacements; though not the only or a complete explanation."

The fact is now clearly established of the existence of double silicates in the soil, and also that it is to these that the soil owes its power to retain ammonia and other soluble elements of plants. We must no longer regard the soil as a mere receptacle for holding the food of plants, but rather as a stomach which digests, so to speak, this food and prepares it for assimilation.

Prof. Johnson concludes his article as follows:

"While the researches of Eichhorn are of the utmost value in aid of the theory of the absorption of fertilizing matters by the soil, they do not suffice to give a full explanation of this process. Doubtless all the reactions that occur between hydrous silicates, sesquioxyds, and saline solutions, may take place in the soil; but in addition to these, a number of other changes must go on there, as the soil is so complex and variable a mixture. The organic matters (the bodies of the humic acid group,) which are often, though not always, present in no inconsiderable quantity in the water extract of fertile soils, can hardly fail to exert an influence to modify the action of the silicates. I have found that a peat (swamp-muck) from the neighborhood of New Haven, (containing when fully dry 68 per cent. of organic matter,) which is highly prized as a means of improving the porous hungry soils in this vicinity, and which when drained grows excellent crops, is capable of absorbing 1.3 per cent. of ammonia, while ordinary soil absorbs but 0.5 to 1 per cent.

"The great beneficent law regulating these absorptions appears to admit of the following expression: *those bodies which are most rare and precious to the growing plant are by the soil converted into, and retained in, a condition not of absolute, but of relative insolubility, and are kept available to the plant by the continual circulation in the soil of the more abundant saline matters.*

"The soil (speaking in the widest sense) is then not only the ultimate exhaustless source of mineral (fixed) food to vegetation, but it is the storehouse and conservatory of this food, protecting its own resources from waste and from too rapid use, and converting the highly soluble matters of the animal exuviæ as well as of artificial refuse (manures) into permanent supplies."

Proverbs of all Nations.

Upon the wisdom contained in proverbs, one need not dilate; "he who runs may read" it and profit by it. We have a little book of these bitter-sweet nuts of literature, compiled by Walter N. Kelly, which offers a choice selection of proverbs of all nations, with an entertaining comment. To us it is "something new under the sun" to find a readable work of this class; we give our readers a chance to judge for themselves, by making liberal extracts. Mr. Kelly's book consists of British proverbs, which means English, Scotch and Irish examples, grouped together and fraternized with continental equivalents, and sometimes with oriental examples, all of which are translated and explained by the compiler.

Under the heading of "Youth and Age," one among many proverbs given by the author, tells us that

"A man at five may be a fool at fifteen."

In the days when cock-fighting was a fashionable pastime, game chickens that crowed too soon or too often were condemned to the spit as of no promise or ability. "A lad," says Archbishop Whateley, "who has to a degree that excites wonder and admiration the character and demeanor of an intelligent man of mature years, will probably be that and nothing more all his life, and will cease accordingly to be anything remarkable, because it was the precocity alone that ever made him so." It is remarked by greyhound fanciers that a well-formed, compact-shaped puppy never makes a fleet dog. They see more promise in the loose-jointed, awkward and clumsy ones. And even so there is a kind of crudity and unsettledness in the minds of those young persons who turn out ultimately the most eminent.

Since the days of Poor Richard, the proverbs that have circulated in almanacs about the country, and which are the most respected by farmers, are those which engender thrift and economy; it is a question whether in a too faithful adherence to proverbial injunctions of this class, people do not become mean rather than economical, close instead of moderate, lean instead of fat. Few farmers eat poultry of their own raising, but sell it and buy salt mackerel, which keeps better and lasts longer. The consequence is, that while the purse fills with the profits of fresh food, the body, for lack of it, becomes scrofulous and wastes away in consumption. Thanks to the researches of physiologists, science is getting to have more moral power than Poor Richard's proverbs o: an old almanac!

"Enough is as good as a feast."

"A bird can roost but on one branch; a mouse can drink no more than its fill from a river" (Chinese.) "He is rich enough who does not want" (Italian.) But the difficulty is to determine to a nicety the point at which there is neither want nor surplus. Practically there is no such point, however it may exist in theory.

Whoever gave birth to the following proverb was a rare genius:

"Hell is paved with good intentions."

A great moral conveyed in a bold figure. What is the worth of virtuous resolutions that never ripen into action? In the German version of the proverb a slight change greatly improves (?) the metaphor, thus: "The way to perdition is paved with good intentions." A Scotch proverb warns the weak in will, who are always hoping to reform and do well, that

"Hopers go to hell."

The following proverb and comment from "Law and Lawyers," may go for what it is worth:

"He that loves law will get his fill of it."

Lord Mansfield declared that if any man claimed a field from him, he would give it up, provided the concession were kept secret, rather than engage in proceedings at law. Hesiod, in admonishing his brother always to prefer a friendly accommodation to a law-suit, gave to the world a paradoxical proverb, "The half is better than the whole." Very often, "A lean agreement is more than a fat law-suit" (Italian.) Lawyer's garments are lined with suitors' obstinacy" (Italian,) and their houses are built of fools' heads" (French.)

Of "Physicians" it is said,

"If the doctor cures, the sun sees it; if he kills, the earth hides it."

"The earth covers the mistakes of the physician" (Italian, Spanish.) "Bleed him and purge him; if he dies, bury him" (Spanish.) It is a melancholy truth that "The doctor is more to be feared than the disease" (French.) "Throw physic to the dogs," is in effect the advice given by many eminent physicians, and by some of the greatest thinkers the world has seen. "Shun doctors and doctors' drugs if you wish to be well," was the seventh, last and best rule of health laid down by the famous physician, Hoffman. Sir William Hamilton declared that "Medicine in the hands in which it is vulgarly dispensed, is a curse to humanity rather than a blessing;" and Sir Astley Cooper did not scruple to avow, that "The science of medicine was founded on conjecture and improved by murder." It is a remarkable fact that "The doctor seldom takes physic" (Italian.) He does not appear to have a very lively faith in his own art. As for his alleged cures, their reality does not pass unquestioned. It is true that "Dear physic always does good, if not to the patient, at least to the apothecary" (German;) but "It is God that cures, and the doctor gets the money" (Spanish.) Save your money, then, and "If you have a friend who is a doctor, take off your hat to him, and send him to the house of your enemy" (Spanish.)—*The Crayon.*

From the British Farmers' Magazine.

Progress of Scientific Agriculture.

Any one who looks back upon the progress of the past half-century, will not refuse to admit that Agriculture has shared largely in the advantages resulting from scientific inquiries and improvements, and their practical application. The time has gone by when men were skeptical on schemes of novel innovation and doubtful expediency, or resolutely objected to every new suggestion or modern improvement. But there are those among us who have lived long enough to remember the days when gas was unknown, save as the mysterious term of philosophy, or when steam-boats were deemed an impossibility, when railroads and their speed were not apreciable either in practice or utility by the minds of even intelligent men of the day, and when the man who would have hinted at ploughing by steam would have been looked upon as a madman; yet all these things have come to pass, and are now to us household words, while science has tamed the very lightning to our uses.

"Now wide the sun of Science flings his beams,
And Wealth her liberal fertilizing showers
Diffuses; while Industry, all nerve, but waits,
Impelled by them, to work such wonders, as
In days long flown and dark, had miracles
Been deemed."

The present method of British farming, is based on great natural laws, which require men versed in science to explain and enforce, and men with enterprising, yet patient and obedient minds, to carry into practice.

The science of Chemistry, applied to Agricuture, has furnished analyses of soils, and by determning the nature of the elements or constituent parts of the various kinds, and the combination of these also in the vegetable productions, has enabled many to judge as to what are the elements needed to be applied in the form of fertilizers. Similar investigations have been made into the character of the substances generally used as manures, and the result has been to develop the principles which constitute more especially the nutritious parts of these fertilizers of the soil. Many substances before unknown, as respects their practical bearing in this point of view, have, on trial, proved to be very valuable; and, after the analyses have been completed, and the elements known, it has been found that new combinations still more effective may be made at a less expense than the natural ones. In bulk, too, manures are thus greatly reduced, as the essence of the principle by which the plant is nourished is extracted and applied without the adjuncts which are usually found with it. How much of the success of farming and indeed of all other arts and manufactures, depends upon the economy of waste substances, upon the saving of material, upon imitating that beautiful law, which chemistry teaches us, that in nature nothing is lost! It is by means of waste substances, decaying animal and vegetable matters, weeds, and bones, and every such material, that the soil is enriched, or if exhausted redeemed, and its annual produce increased. With what care are not bones collected here and on the continent, every grain of bone-dust being gathered up like gold, and commerce bringing us thousands of tons, whether it be from the pampas of South America, the prairies of North America, the battle-fields of Europe, the interior of Africa, or the cities of Australia! What fortunes have not the gathering of bones realized! and how has the turnip-fly been cheated out of his favourite morsels by the application of bone-dust!

Cultivation is the economy of force.—Science teaches us the simplest means of obtaining the greatest effects with the smallest expenditure of power, and with given means to produce a maximum of force. The unprofitable exertion of power, the waste of force in agriculture, in other branches of industry, in science or in social economy, is characteristic of the want of true civilization. We sow, we reap, and we thrash by machinery, and steam has been harnessed to the plough, and by proper drainage, the skilful rotation of crops, the application of guano, and various artificial manures, applied in due proportions according to the nature of the soil, as shown by analysis, we double and treble our grain crops.

Agriculture in this country is advancing in all its branches, and in none more than in such as are promoted by, or depend upon, the use of improved machinery.

Already the colonies are beginning to be alive to the advantages of steam husbandry, for British Guiana offers a premium of £1,000 for the successful introduction of a steam plough into that colony, and a similar amount for the successful introduction of a steam-digging or grubbing machine.

The wheat grown in Great Britain (Ireland not reckoned) in 1801 to 1810 was but sufficient to supply at the average rate of 8 bushels per head, 11,000,000 of persons: at the present time the land produces sufficient wheat to feed more than 17,000,000, to say nothing of the additional quantities of other produce raised. Agricultural chemistry has enlarged the domain of knowledge in that important branch of scientific research.

Combination and discussion have done much good. They have driven away the old lethargy and apathy, the bigotry and ignorance which often prevailed among those engaged in husbandry. The proceedings and transactions of the Royal Agricultural Society, the Royal Dublin Improvement Society, the Highland and Agricultural Society of Scotland, the Farmers' Club, the local agricultural societies, and the numerous journals devoted to agriculture, have all diffused a large amount of practical and scientific information.

How much has been done, too, in the introduction of new plants and seeds—whether for forage or for food—in the selection of new varieties of wheat, barley, oats, and turnips, &c. The choice of suitable varieties is even of more importance than the choice of a good soil. Our scientific agriturists no longer regard the plant as a mere machine, acting a mechanical part, and guided by certain chemical changes: it is a far more subtle thing, it is guided in its development by the laws of life, which overrule all chemical action. Thus chemistry is no longer the solitary guiding star of the scientific farmer: physiology must go with it, hand in hand, in all that relates to improved cultivation. When improved varieties are once obtained, high cultivation is necessary for the continuance of those properties that render them valuable. When cultivated plants are neglected, and allowed to grow in a poor soil, they soon revert to their wild condition. It therefore requires a continuance of suitable conditions to perpetuate those peculiarities which render them useful to man; hence the great attention requisite to keeping up the supply of those elements essential to the building up of the structure of the plant. If they are not present naturally, they must be supplied in the form of manure, which may be of various kinds, according to the circumstances of the case. As Sprengel observes, "a soil is often neither too heavy nor too light, neither too wet nor too dry, neither too cold nor too warm, neither too fine nor too coarse; lies neither too high nor too low, is situated in a propitious climate, is found to consist of a well-proportioned mixture of clayey and sandy particles, contains an average quantity of vegetable matter, and has the benefit of a warm aspect and favouring slope;" but although possessed of all these advantages, it is yet unproductive, because it wants some mineral constituent required for plant food. In new countries there is a strong tendency to carry off annual crops from the land, without giving anything back. This was especially the fault, for a long time, in Canada, and Australia, and in the tropical islands of the West Indies, Ceylon Mauritius, &c. Little or no manure was given to the coffee trees. The stalk of a sugar-cane, after being pressed for the juice, was burnt for fuel, instead of being returned to the soil. Now, however, better practice prevails. The sugar planters of Barbados, Mauritius, &c., find their interest in importing large quantities of guano and other manures, and by high cultivation succeed in obtaining enormous annual returns of sugar.

In a comparatively short time, systematic draining has completely changed the aspect of extensive tracts of country in Britain, converting the cold morass into fertile fields, and greatly increasing the annual produce, even on soil which was before bearing crops sufficient to satisfy the most exacting expectations.

The late Professor Johnston, in his lectures in America, pointed out the following among the greatest practical improvements in the treatment of land, by means of which British agriculture has been advanced to its present condition: The alternate husbandry, a judicious rotation of crops; the introduction of thorough drainage and deep and subsoil ploughing; the judicious and continued application of lime, and the use of bones in various forms—generally what is called "high farming," comprehending the culture of green crops extensively, the making of rich loams, and the purchase of valuable foreign manures of various kinds, to a great extent; the rearing and feeding of improved breeds of stock; the custom of full feeding both for plants and animals; the introduction of lighter and better contrived implements, and of machines to economise labour, and horses having a quicker step.

Such, then, are generally the practical methods or processes by which British agriculture has been advanced to its present condition. To most of our readers these are well known facts, which it may almost seem superfluous to recapitulate and comment on; but the new settlers in distant colonies, and the rising generation at home, interested in agriculture, may well be reminded of the great practical improvements which have enabled the British farmer to sustain the prolific yield of his soil, and to compete with the abundant produce obtained with little trouble in new lands, requiring at present but little care, culture or science. The lesson of perseverance and progress, in the sucessful adoption of new processes of culture and new machinery, whether for ploughing, sowing, hoeing, or reaping, &c., will at least not be lost, and may stimulate further invention and enlarged experiments.

From the Gardener's Monthly.

Forcing.

Few subjects are better worth the attention of nurserymen, market gardeners, and amateurs, than this very interesting branch of gardening; but it has been strangely, and unaccountably, neglected. Whether as a source of pleasure or profit, it is an equally delightful occupation; and the considerable space we intend to occupy with the subject, will, we trust, be the means of awakening some enthusiasm in its behalf.

Potatoes, Peas, Beans, Cauliflower, Radishes, Lettuces, Tomatoes, Asparagus, Rhubarb and Parsley, are the chief vegetables usually forced; and, among fruits, the Apricot, Cherry, Fig, Grape, Nectarine, Peach, Plum and Pine.

Grapes, every one wishes to grow. For early forcing, they are the best grown in pots, that is, where fire heat is used; when a "cold grapery" is employed to produce them, they are usually grown in the open ground. This is a good season to prepare for the latter mode of culture, so as to have everything ready to plant out the vines next spring. Houses can now be constructed from one to three dollars per running foot, and capable of growing grapes to perfection, and in many places, from fifty cents to one dollar a pound, can be very readily obtained for the fruit. The borders for the vines need not be expensive. A dry bottom is essential, which must be obtained either by draining, or, what is better, elevating the borders above the surrounding soil. A very durable and substantial border may be made by taking out the soil two and a half feet deep, and filling in with bones and broken stones, lumps of charcoal, brickbats, or any coarse material, to the depth of one foot, then filling in the remaining three inches deep with sods from an old pasture, to which, about a third of well decomposed cow or horse manure has been added. The border may extend under the vinery, and some ten or fifteen feet beyond. Pot vines are usually fruited the year following that in which they are raised. Plants struck last spring, and grown all summer, will now be ready, either to put away till wanted in spring, or started at once, where sufficient heat is at command. They should be at once pruned to the desired length, usually about six feet, the laterals taken off, the canes painted with a mixture of sulphur and soap, to destroy insects; and those not just now required, either put in a cellar or shed, secure from frost to avoid danger to the pots. Those desired to fruit early, should be at once placed in a temperature of 55 to 60 degrees, and the canes bent down to aid in causing all the buds to burst equally. This, however, depends on the condition of the cane itself. A vine with badly developed buds will not break well, no matter how well managed. The buds will only swell under the above temperature; but it is not well to start with much heat.

In a house of this character the Fig may also be started at the same time, and the Pine grow very well. The other fruits named will not do so well started with these, unless in the hands of greatly experienced gardeners, as the heat necessary to ripen the grapes so early, is too much for them. Dwarf Beans, Tomatoes and Cucumbers, would, however, do very well. These may be sown at once for this purpose. Peaches, Nectarines, and Apricots, do very well planted at the back wall of vineries, and especially do they do well in tubs and pots. For the latter mode it is best to grow them one season before forcing, as better and handsomer specimens can be made from one year grafted plants. Now is the time to select those that we may desire to force the next spring. They should be lifted and potted very carefully, and afterwards placed in a cool cellar till February. Those that were potted last spring, and have a good growth, and are established sufficient to warrant an early forcing, may at once be started in a heat of from 45 to 50 degrees, and the heat increased to 55 degrees in the course of a few weeks. They should be previously cleaned, as already recommended, for grapes. Plums and Cherries do not do very well forced. The difficulty is in getting them to ripen well. I have usually had the best success when started with peaches at this time. Strawberries force easier than any fruit, and in my opinion, when gone into properly, will pay even better than grapes. They may be had all the year round when a heat of 60 degrees can be maintained, simply by bringing forward a few every two weeks. The pots of plants should be prepared in September, six inch sizes being employed. They should be started in a heat of 50 degrees, till the flowers are set, and ripened in one of 60 degrees. They must be kept near the glass, and the Red Spider carefully watched. Those who have not command of heat, may have them very early by potting good plants, keeping them in a moderately dry place till February, and then setting them in frames. A house fitted up for strawberry forcing, is just the place to force Asparagus, Rhubarb, Radishes, Peas and Potatoes, which do not do well with much heat. Any of these may be started now either in pits or boxes. Peas are scarcely worth forcing, except as a luxury. They will not bear freely unless very near the light.

A Cauliflower pit should be in every garden, where leaves or manure can be had. Radishes and Lettuce can be forced at the same time, and will be in use before the Cauliflower grows in their way. Pits of stone or brick, about six feet under, and one or two above the ground, are usually employed, with glass sashes over. The leaves should be filled in as early as possible, so as to get their most violent heating over, before the plants are set out. A watering as they are filled in assists this, which may be known to be effected by the sinking it exhibits. It is important to have the plants set as near the glass as possible, a few more leaves should therefore be added before the six inches of soil required is placed on. The plants, sown in September, should be planted fifteen inches apart, and Lettuce and Radishes may be sown broadcast between. Asparagus, Rhubarb, and Parsley, are prepared by taking up the old roots at this season.

From the Country Gentleman.

"How to make Butter."

Under the title of "Our Farm of Four Acres," a little book was published the past season in London, detailing the experiences in cultivating and dairying to the extent thus specified, of a family whose circumstances compelled them to retire from city to country for the sake of economy.

The head of one chapter is quoted above, and we think its contents will be read with some interest:

"Let the cream be at the temperature of 55 to 60 degrees; if the weather is cold, put boiling water into the churn for half an hour before you want to use it: when that is poured off, strain in the cream through a butter cloth. When the butter is coming, which is easily ascertained by the sound, take off the lid, and with one of the flat boards scrape down the sides of the churn; and do the same to the lid: this prevents waste. When the butter is come, the butter-milk is to be poured off, and spring-water put in the churn, and turned for two or three minutes: this is to be then poured away, and fresh added, and again the handle turned for a minute or two. Should there be the least appearance of milkiness when this is poured from the churn, more is to be put up. This we found was a much better mode of extracting all the butter-milk than placing it in a pan under the pump, as we did when we commenced our labours. The butter is then to be placed on the board or marble, and salted to taste; then, with a cream-cloth, wrung out of spring-water, press all the moisture from it. When it appears quite dry and firm, make it up into rolls with the flat boards. The whole process should be completed in three-quarters of an hour.

"We always used a large tub, which was made for the purpose, and every article we were going to use was soaked in it for half an hour in boiling water; then, that removed, and cold spring-water substituted; and the things we required remained in it till they were wanted. This prevents the butter from adhering to the boards, cloth, &c., which would render the task of 'making it up' both difficult and disagreeable.

"In hot weather, instead of bringing the cream-crock into the kitchen, it must be kept as cool as possible; for as it is essential in the winter to raise the temperature of the cream to the degree I have stated, so in the summer it must be lowered to it. Should your dairy not be cool enough for the purpose, it is best effected by keeping the cream-pot in water as cold as you can procure it, and by making the butter early in the morning, and placing cold water in the churn sometime before it is used. By following these directions you will have good butter throughout the year.

"The cows should be milked as near the dairy as possible, as it prevents the cream from rising well if the milk is carried any distance.* It should be at once strained into the milk-pans, and not disturbed for forty-eight hours in winter, and twenty-four hours in summer. In hot weather it is highly important that the cream should be perfectly strained from the milk, or it will make it very rank. Half a dozen moderate-sized lumps of sugar to every two quarts of cream tend to keep it sweet. In summer always churn twice a week. Some persons imagine that cream cannot be 'too sweet,' but that is a mistake; it must have a certain degree of acidity, or it will not produce butter, and if put into the churn without it, must be beaten with the paddles till it acquires it. The cream should, in the summer, be shifted each morning into a clean crock, that has first been well scalded and then soaked in cold water; and the same rule applies to all the utensils used in a dairy. The best things to scrub the churn and all wooden articles with, are wood-ashes and plenty of soap.

"In some parts of the country, the butter made by the farmers' wives for sale is not washed at all; they say, 'It washes all the taste away.' They remove it from the churn, and then taking it in their hands, dash it repeatedly on the board; that is what they call 'smiting' it. The butter so made is always strong, and of two colours, as a portion of the butter-milk remains in it; if any of it were put into a cup, and that placed in hot water for the purpose of clarifying, there would, when it was melted, be found a large deposit of butter-milk at the bottom of the cup. We have tried the butter made our way, and there was scarcely any residuum.

"Besides, this 'smiting' is a most disgusting process to witness. In warm weather the butter adheres to the hands of the 'smiter,' who puffs and blows over it as if it were very hard work. Indeed, I once heard a strong-looking girl, daughter of a small farmer in Kent, say she was never well, for 'smiting' the butter was such dreadful hard work it gave her a pain in her side. After this 'smiting' is over, it is put on a butter-print, and pressed with the hands till it is considered to have received

* In very cold weather the milk-pans must be placed by the fire some time before the milk is strained into them, or the cream will not rise.

the impression. It is then, through a small hole in the handle, blown off the print with the *mouth*.

"I don't think I shall ever again eat butter which appears at table with the figures of cows, flowers, &c., stamped on it. I should always think of the process it has gone through for the sake of looking pretty. Nearly all the fresh butter which is sold in London, is made up in large rolls, and, like that we make ourselves, need not be touched by the fingers of the maker."

Soil.

To the Editors of the Franklin Observer:

Sirs:—It seems to the writer that the question relative to the mineral and agricultural resources of the South-western counties is, what are probabilities of the future in these respects, and not what they are now; for in a country where the inducements for development and improvement are limited, it cannot be expected that remarkable and inviting prospects can be shown immediately upon the surface. Both mining and agricultural interests are slowly developed, and it is only upon and by encouragements which markets and profits hold out that men are induced to act, and hence, when market facilities are provided, an entire change in the feelings of a community take place, which result in enterprise which either brings to light mineral resources, or lead to a systematic and profitable husbandry.

In the South-western counties, agriculture has to contend with the disadvantages of distant markets, where intercourse is difficult and expensive; and hence, the inducements to labor energetically for large crops are too small to move a community, though individual exertions in a few instances are met with which have resulted in proving the capacity of the soil for the production of great crops. When all things are taken into consideration, which affect the capacity of a soil, climate, composition and depth, few sections can compare with the South-western counties of North Carolina. It is true, it is studded with mountains, but they are clothed with a great depth of soil, but bear the finest and most valuable forests of hard and soft woods or timbers in the world. Nothing surprises a traveller more than the extreme depth of soil and the massive timber tree which it supports; from the valley to the summits of the Balsam and Nantahala Mountains.

But the writer does not propose to speak particularly of the agricultural interests, now, neither indeed upon the mineral interests, except in a few particulars. Of the mineral interests, they may be divided into two branches of industry. 1st. The interest connected with the production of metal. 2d. That connected with and existing in the rocks proper. Of the Western counties which are destined to furnish metalic material, Jackson County is rich in copper, while Macon and Cherokee will produce the most iron. The Savannah copper mines of the Cowee Mountains, those of the Collowhee and Way-yehut-te, are sufficiently enveloped to enable the miner to base a safe opinion, and entertain the expectation that they are destined to become profitable mines, provided a way to market is opened.

The hæmatitic iron ores of the Nantahala are certainly inexhaustible beds, whose character for goodness are not exceeded by the best ores of Salisbury, Connecticut, which has long been celebrated for its iron.

Of the rocks of these counties, we may feel assured of the existence of fine marble, suitable for statuary and other purposes for which marbles are employed. The most important variety is the clear flesh colored marble of Nantahala, which is really unique for the delicacy of its tints.

The same region furnishes, also, fine roofing slates of a blue color. Plates of slate may be obtained, five and six feet in length, and two feet wide. It splits with ease and with a perfect plane.

The quartz rock of the Nantahala are suitable for mill-stones, and besides this variety, there is a species of porous chalcedony, which resembles the common French burr stone. We have whet-stone, mill-stone, and grind-stone grist; fire-stone and rock suitable for glass, and in Macon County the finest porcelain clay. The foregoing embrace some of the important mineral products which are inexhaustible, but which, under existing circumstances, are nearly useless; but which will become of immense value when a cheap and commodious way is opened to the markets of the world.

I am gentlemen, truly yours,

E. EMMONS, State Geologist.

Franklin, Aug. 29, 1859.

Sources of Fertility in Soils.

Liebig, in his chemical researches, says: "If we calculate from the result of ash-analysis, the quantity of phosphoric acid required by a wheat crop, including grain and straw, we find the wheat demands more abundant supplies for phosphoric acid than any other plants. Wheat consumes phosphoric acid in greater quantities during the growth of the seed than at any other period; and this is the time when practical men believe the soil to suffer the greatest exhaustion. Plants in general derive their carbon and nitrogen from the atmosphere, carbon in the form of carbonic acid, nitrogen in the form of ammonia; from water (and ammonia) they receive hydrogen; and sulphur from sulphuric acid."

Bondrimont mentions the existence of interstitial currents in arable soils, and the influence they exert on agriculture. He states "that there is a natural process at work, by which liquid currents rise to the surface, and thus bring up materials that help either to maintain its fertility or modify its character. Many phenomena of agriculture and vegetation have at different times been observed, which, hitherto inexplicable. are readily explained on this theory; such, for example. as the improvement that takes place in fallows; and there is reason to believe that these currents materially influence the rotation of crops.

Take the mastery views of Schlieden, in Germany. He asserts that "the goodness of the soil depends on its inorganic constituents; so far, at least, as they are soluble in water, or through continued action of carbonic acid, and the more abundant and varied these solutions the more fertile is the ground."

The amazing yield of Indian corn in Mexico, from two to six hundred fold, is something which, with all our skill, we cannot accomplish, and is a fact in favour of the argument, "that in no case do the organic substances contained in the soil perform any direct parts of the nutrition of plants."

All chemists are agreed as to the source from which the oxygen and hydrogen of plants are derived. the principal of which is water. All of them agree that the carbon of vegetables is derived principally from the air, partly from the soil. It becomes evident, then, from the most conclusive proofs, that *humus* in the form in which it exists in soils does not yield the smallest nourishment to plants. The excellent advantages derived from the experiments of talented and industrious men, who have directed every effort to aid practical agriculture, justly entitle them to golden praise from mankind. Liebig has the merit of having been the first who laid before the public some views as to the source of the constituents of plants. He remarks: "How does it happen that wheat does not flourish on sandy soil, and that a (calx or) calcareous soil is unsuitable for its growth, unless it is mixed with a large quantity of clay? It is because these soils do not contain alkalies and certain other ingredients in sufficient quantity; and, therefore, the growth of the wheat is arrested, even though all other substances should be present in abundance."

In some soils there may be too much straw-making food, but not enough for the maturing of the grain. Again, the absence of the necessary moisture in the soil will cut off the supplies of food to plants. But an excess of it may cause available food wanting for the development of the grains to be appropriated to the straw. In very wet seasons, especially in the absence of under-drains, where there is much straw-making food and a deficiency of phosphates, the latter is taken up by the stalks and leaves, to the loss of the grain; hence, soils may yield less grain in a wet season, but more straw than they would do in a dryer one, other things being equal.

"Grain is carried to the cities, and the substances in the soil that made it are removed far away from the original source, and the soil is robbed of it, and but a small portion of their elements are sent to the soil from whence they were taken." In nature's economy nothing is lost; but when man displaces things, he should put them back again in their own places. The wheat-grower should return to his lands in the shape of fertilizers the same elements which he has taken, or he will soon find the soil exhausted, so that he cannot produce the same grain. In many of our best wheat growing places in the West, the lands are so much exhausted that wheat crops do not pay for their labour and expense of growing. The common opinion hitherto prevalent, and still held by some, that the soil of the West cannot be exhausted, is, therefore, a great mistake.

In our cultivation of wheat we have exhausted the soil of so much of the elements that produce it, that maize is fast taking the place of wheat, especially in the prairie districts, where the ground is less protected by the snow in winter than in others. In Canada, where the winter is severe, the ground being covered by snow, the wheat does not suffer as that sown in more changeable climates. It is found by experience that in a climate where there is little snow, the land needs to be fertilized and plowed deep, in order to give the roots a strong hold in the soil. Fertilization will cause a vigorous growth, and the roots of plants in well prepared soils strike deep and hold fast. This increases the growth of the plant and augments the quantity and quality of the crops.

Correspondence of the Boston Cultivator.

From the Hartford Homestead.

Prof. Mapes' Superphosphates.

The State Agricultural Society of Connecticut has just closed one of its most successful annual Fairs. It is gratifying to know that at this exhibition so many of her citizens were congregated from all parts of the State as to swell the receipts to over 10,000 dollars.

The commercial advantage thus accruing to the Society, and which is indispensable to its healthful administration, is by no means the chief advantage. New ideas of improved agriculture and progressive mechanics and manufactures have been taken to the homes of more than fifty thousand of the sons and daughters of the State. Each has become familiar with some of the better productions of remote portions of the State, which could not otherwise be seen or known. New acquaintances have been formed, exchanges arranged, and a new impulse imparted for a higher standard of husbandry and handicraft.

The Connecticut State Agricultural Society is wisely appropriating a portion of its funds for the benefit of its members and the community at large, by the employment of an able chemist, who is industriously engaged in the examination of various materials used for manurial purposes. A series of papers have already been published, giving the analysis of muck, peat, bones, and the different varieties of special manures which have been offered in the market.

By these investigations, the true value of these various commodities is determined, and the agricultural community protected from imposition.

We subjoin a late paper from Prof. Johnson on the character and value of "Prof. Mapes' Superphosphates of Lime," which have been so much lauded by the manufacturer:—

Report of Prof. S. W. Johnson, Chemist to the Society, on Mapes' Superphosphates of Lime.

HENRY A. DYER, ESQ., Cor. Sec. of the Ct. State Agricultural Society:

Dear Sir,—Of all the many fraudulent and poor manures which have been from time to time imposed upon our farmers during the last four years, there is none so deserving of complete exposure, and sharp rebuke, as that series of trashy mixtures known as "Mapes' Superphosphates of Lime."

It is, indeed, true that worse manures have been offered for sale in this State; but none have ever had employed such an amount of persistent bragging and humbuggery to bolster them up, as has been enjoyed by these.

Seven or eight years ago "Mapes' Improved Superphosphate," was almost the only manure of the kind on sale in our northern markets. Then it was of good quality, and contained soluble phosphoric acid 10.65 per cent.; insoluble phosphoric acid 10.17 per cent.; ammonia (actual and potential) 2.78 per cent., and had a value (calculated on present prices) of $44 per ton. It was sold at $50 per ton. This manure was the prototype of the following formidable series, viz: Mapes' nitrogenized superphosphate of lime, $4 per bag, $50 per ton; Mapes' No. 1, superphosphate of lime, $3 60 per bag, $45 per ton; Mapes' superphosphate of lime, $3 20 per bag, $40 per ton; Mapes' cotton and tobacco superphosphate of lime, $3 20 per bag, $40 per ton; Mapes' potash superphosphates of lime, $2 80 per bag, $35 per ton.

In my first annual report (page 28, 2d ed.) may be found analyses of the "nitrogenized," made on samples collected in the Connecticut markets, in the years 1856 and 1857. The calculated value of this manure was $21 in case of the sample analyzed in

1856, and $14 50 and $12 50, respectively, for the specimens examined in 1857.

In my first report these manures were noticed in these words: "It is clear that this is a brand not to be depended upon, and the material that has come into Connecticut the past year (1857) is hardly worth a long transportation."

I now communicate analyses of four samples, made the present year, and it will be seen that no improvement has taken place:

ANALYSES OF FOUR SAMPLES MAPES' SUPERPHOSPHATES, TAKEN BY MASON C. WELD, FROM THE STOCK OF HARTFORD, CONN.

INGREDIENTS.	Mapes' cotton and tobacco superphosphate of lime. From 160 lb. bag.		Mapes' No. 1 superphosphate of lime. Taken from 160 pound bag.		Mapes' nitrogenized superphosphate of lime. Taken from 160 lb. bag.		Mapes' nitrogenized super-phos. of lime. Taken from 1 lb. sample can.	
Moisture expelled at boiling heat	13.42	13.42	18.70	18.87	20.55	20.75	14.37	14.32
Matters expelled at red heat....	17.50	17.38	25.35	25.15	19.80	19.72	23.87	24.02
Sand and insoluble matter.....	17.85	18.10	13.60	13.70	12.17	12.50	12.67	12.57
Lime..........................	23.48	23.84	17.91	18.07	16.63	16.18	19.41	19.39
Insoluble phosphoric acid, ...	8.15	8.15	8.05	8.03	8.10	8.13	10.47	10.65
Soluble " "	trace.		trace.		None.		.57	.68
Potash......................								
Iron, sulphuric and carbonic acids, etc., not determined.....	19.60	18.21	16.39	16.18	22.75	22.72	18.64	18.37
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Potential ammonia....	1.67	1.70	1.90	1.87	2.14	2.11	3.94	3.98
Calculated value. (per 2,000 lbs..)	$12 10		$12 50		$13 18		$22 24	
Price. (per 2,000 lbs..).........	40 00		45 00		50 00		50 00	

I have not been able to get samples of all the kinds above specified, but those whose composition is here given, will serve to characterize the manufacture.

The agents for Mapes' superphosphates are furnished not only with the articles in bulk or in bags of 160 pounds each; but also with one pound samples put up in cans, which they are instructed to furnish gratuitously to any who are desirous of trying the manure.

It was, of course, interesting to learn how closely these trial samples correspond with the material which purchasers receive, and in case of the "nitrogenized superphosphate," both classes of samples have been examined. The result is highly instructive, and shows that a small specimen of one pound in a can, worth at the rate of $22 per ton, is to make the farmer swallow the 160 pound bags, the contents of which have the extraordinary value of $13 per ton.

Another remarkable feature to be noticed in the above analyses is, that the three specimens taken from 160 pound bags, and bearing different names, are, so far as their valuable ingredients are concerned, the same thing. The "cotton and tobacco," the "No. 1," and the "nitrogenized," letting the cans alone, are equally good, or I should rather say, equally bad! This fact proves that nothing is meant by the difference of names, except to confound the purchaser, and make him imagine that among this great variety of fertilizers, some one must be adapted to his fields and crops.

It is a well established fact, that the tobacco crop removes a large amount of potash from the fields, and accordingly this substance was looked for in the cotton and tobacco superphosphate, but it was not to be found.

Another point to notice is, that these mixtures, the calculated value of which is from one-quarter to one-third of what is demanded for them, are now sold under the analyses and recommendations that were procured, years ago, on what was really, at that time, the best superphosphate in the country.

Whoever proposes to invest money in a superphosphate, should take notice that, the canal sample excepted, neither one of these three kinds that have been examined contained any weighable quantity of soluble phosphoric acid, and hence the seller is doubly liable to the charge of obtaining money on false pretences.

The inventor of these fertilizers, Prof. J. J. Mapes, is also the inventor of a new doctrine, dating back only a few years, to the effect that there is a progressive increase in the value of the ingredients of a fertilizer, in proportion to the number of times it becomes a part of an animal or plant, and that, therefore, a mineral phosphate, for example, is comparatively worthless as a manure, considered beside a phosphate that is derived from the bones of an animal.

We have only to carry out this principle far enough to show its utter absurdity, for by a vastly great number of "progressions," the point will be finally arrived at, when a grain of "progressed" phosphate shall equal a ton of sombrero guano, or other mineral phosphate. The only use that this vagary of the "progression of ultimates," or "progression of primaries," can serve, appears to be, to account for the great value of Mapes' superphosphates! Are we to believe that the few *per cent.* of really valuable fertilizing matters they contain, is so far *progressed* as to be already worth three or four times as much as the same ingredients of other manures? Are the insoluble phosphates of these manures as good, and hence deserving as good a name as what are ordinarily known as soluble or real superphosphates? Do the materials, (*primaries, ultimates,*) out of which these manures are made, "progress" with such rapidity, that a manure which, in 1852, contained twenty-one per cent. of phosphoric acid, could produce an equal effect in 1857, though containing but thirteen per cent., and in 1859, only requires to contain eight per cent.? Absurd as the doctrine of progression of ultimates in the abstract is, its logical applications are, if possible, more so, and will not find currency in Connecticut we may be sure.

Yale Analytical Laboratory, Sept. 24.

Farmers---Take a Hint.

It is very surprising to see how slow men are to take a hint. The frost destroys about half the bloom of the fruit trees; everybody prognosticates the loss of fruit; instead of that, the *half* that remains is larger, fairer and higher flavored than usual, and the trees, instead of being exhausted are ready for another crop the next year. Why don't the owner *take the hint* and thin out his fruit every bearing year? But no: the next season sees his orchard overloaded, fruit small, and not well formed; yet he always *boasts* of that first-mentioned crop without profiting by the lesson it teaches.

We heard a man saying, "the best crop of celery I ever saw, was raised by old John ———, on a spot of ground where the wash from the barn-yard ran into it after a hard shower." Did he take the hint, and convey such liquid manure in trenches to his garden? Not at all; he bragged about that wonderful crop of celery, but would not take the hint.

We knew a case where a farmer subsoiled a field, and raised crops in consequence, which were the admiration of the neighborhood; and for years the field showed the advantage of deep handling. But we could not learn that a single farmer in the neighborhood took the hint. The man who acted thus wisely sold his farm, and his successor pursued the old way of surface-scratching.

A staunch farmer complained to us of his soil as too loose and light; we mentioned ashes as worth trying: "well now you mention it, I believe it will do good."

"I bought a part of my farm from a man who was a wonderful person to save up ashes, and around his cabin it lay in heaps. I took away the house and ordered the ashes to be scattered, and to this day I notice that when the plow runs along through that spot, the ground turns up moist and close-grained." It is strange that he never took the hint!

There are thousands of bushels of ashes lying not far from his farm about an old soap and candle factory, with which he might have dressed his whole farm.

A farmer gets a splendid crop of corn or grain from off a grass or clover lay.

Does he take the hint? Does he adopt the system which shall allow him every year just such a sward to put his grain on? No, he hates book-farming and scientific farming, and "this notion of rotation;" and jogs on the old way.

A few years ago our farmers got roundly in debt; and they have worried and sweated under it, till some of them have grown greyer, and added not a few wrinkles to their faces. Do they take the hint? Are they not pitching into debt again?—*Fruit, Flowers and Farming.*

Horse-Shoes Must be Beveled on the Ground Surface.

An iron shoe tacked on a horse's foot, says the *American Veterinary Journal*, is one of the avoidable evils of domestication, yet when properly applied is not so great an evil as some persons might suppose. One of the objects in applying the shoe, is to preserve the natural concavity of the sole of the foot. A horse in his natural state, and, indeed, up to the period of his first introduction within the precincts of the "smithey," has, generally, a concave sole; and wisely is it so ordained: were it otherwise the animal would be unable to secure a foot-hold; as it is the inferior edge of the hoof—that is, the ground surface—projecting beyond the sole, may be compared to the point of a cat's claw, or the nails of a man; they grasp, as it were, bodies with which they come in contact, and thus secure a point of resistance, which aids in advancing limb or body, over a smooth surface. Now, in order to preserve the natural mechanical functions of the horn and sole, the ground surface of the shoe must correspond to the ground surface of the foot; that is to say, the ground surface of the shoe must be beveled, cup fashion; its outer edge being prominent, takes the place of the hoof; its inner surface being concave, corresponds to the natural concavity of the foot. It is a custom among some blacksmiths to reverse the above procedure, and place the concave surface next to the foot; and often the ground surface appears to be more *convex* than concave, in justice, however, to that much abused individual, the shoer (who is not always at fault,) we remark, that often he is not allowed to use his own judgment, for, as some people believe, "anybody can *doctor* a horse," so an equal number have an idea that they know all about *shoeing* him, and men will often stand over the smith, and direct him as to the form of shoe and manner of securing it to the foot.

Notwithstanding men's various opinions on the general art of shoeing horses, we think that all will sooner or later agree with us, that a beveled, or cup-shaped, ground surface is the best. We care not what may be the form of the foot, whether it be high or low-heeled, contracted at the heels, lengthened or shortened at the toe, or having a concave or a convex sole: it is all the same. The ground surface must always be *concave*. In every other part of the shoe, improvements and alterations are suggested, and, indeed, required, in consequence of the ever-varying form and action of the horse's foot under the state of health and disease; but, on the inferior surface of the foot, we are presented with a pattern for the ground surface of a shoe, which no man can ever improve on, and if we were to follow that pattern more closely, there would be fewer accidents in *falling* and less lame horses.

Politicians and Farmers.

Politicians who want an office frequently make great pretensions to the agricultural knowledge, and figure largely at the cattle shows. It is said that Governor ——— is one of this sort of "farmers," and in illustration thereof the following good story is in circulation:

Not many springs ago, his excellency, in company with another distinguished citizen of ———, was riding in the country. In passing a beautiful field of grain, just beginning to head, the Governor reigned in his horse, and burst into rapturous admiration of the wheat.

Quoth Ned—"Governor, how much will that yield to the acre?"

"Oh, from about seventeen to twenty bushels."

"What kind of seed is that from, Governor?"

"Common winter. This is by far the best for this soil."

"You are the President of the Agricultural Society, are you not, Governor?"

"I am, sir."

"Delivered the address before the Agricultural Society of New York last year?"

"Yes, sir."

"You are the author of an eloquent passage about the cultivation of roots and tops?"

"A mere trifle, Ned."

"Well, you are the only agricultural writer I ever saw who could not tell oats from wheat!"

Labor, continuance, constancy. Life's trinity. Turn them into their proper channels, and the meanest intellect can rise to usefulness and honor. Without them the finest talents are of no avail.

From the Rural Register.

Milk, and Dairy Produce Generally.

"The Composition of Milk."—The appearance and the usual qualities of milk, are too well known to require descr ption here. It differs considerably in its composition as obtained from different animals, but its general nature is similar in all cases. From 80 to 90 lbs. in every 100 lbs. of cow's milk, are water. This quantity may be increased by special feeding for this purpose. Some sellers of milk in the neighborhood of large cities, who are too conscientious to add pump-water to their milk, but who still desire to dilute it, contrive to effect their purpose by feeding their cows on juicy succulent food, containing much water; such watered milk they are able to sell with a safe conscience, though it may be doubted if the true morality of the case, is much better than if the pump had been called directly into action.

From 3 to 5 lbs. in each 100 lbs. of milk, are curd or casein; this is a nitrogenous body like gluten, albumen, animal muscle, &c. Casein is a white, flaky substance, and can be separated from the milk in various ways. There are also in every 100 lbs., from 4 to 5 lbs. of a species of sugar, called *milk sugar;* this is not so sweet as the cane sugar, and does not dissolve so easily in water. It may be obtained by evaporating down the whey, after separation of the casein or curd. In Switzerland, it is made somewhat largely, and used for food.

The butter or oil amounts to from 3 to 5 lbs. in every 100 of milk. Lastly, the ash is from ¼ to ¾ lb. in each 100. This ash is rich in phosphates, as shown in the following table; it represents the composition of two samples, each of the ash from 1000 lbs. of milk.

	No. 1.	No. 2.
Phosphate of lime,.......	.23	.34
Phosphate of magnesia,....	.05	.07
Chloride of potassium,....	.14	.18
Chl'de of sodium (com. salt,)	.02	.03
Free soda,...............	.04	.05
	0.50	0.67

The butter, as stated above, is from 3 to 5 lbs. in each 100 of milk. It exists in the form of minute globules, scattered through the liquid. The globules of butter or fat, are enveloped in casein or curd, and are a very little lighter than the milk; if it is left undisturbed, they therefore rise slowly to the surface and form cream. If the milk be much agitated and stirred about, the cream will be much longer in rising; so also if it is in a deep vessel, as a pail, in place of shallow pans. Warmth promotes its rising.

When milk is drawn in the usual way from the cow, the last of the milking is much the richest; this is because the cream has, in great part, risen to the surface inside of the cow's udder; the portion last drawn off then, of course contains the most of it. Such a fact shows the importance of thorough and careful milking. In some large dairies, the last milkings from each cow are collected in a separate pail. More milk is said to be obtained from the same cow when she is milked three times a day, than when but once or twice; less when milked once than twice, but in this last case it is very rich.

Some large breeds of cows, are remarkable for giving very great quantities of poor watery milk; other small breeds give small quantities of a milk, that contains an uncommon proportion of cream. These large breeds are kept in many parts of the country about London, for the purpose of supplying the city. By giving them succulent food, the milkmen contrive to increase still farther the watery nature of their milk, as before noticed.

The small breeds have one great advantage: it requires a much lesss quantity of food to supply the wants of their bodies, so that all over that quantity goes to the enriching of the milk. A weight of food, therefore, with which they could give good milk, would only suffice to keep up the body of the larger animal, and the milk would consequently be poor and watery. This is, probably, one chief reason, why the milk of the small breeds generally excels so decidedly in richness.

Of Butter.—We are now to consider the various methods of making butter, and some of the questions connected with its preservation. The object in churning, is to break up the coverings of the little globules of butter: this is done by continued dashing and agitation: when it has been continued for a certain time, the butter appears first in small grains, and finally works together into lumps.

Where cream is churned, the best practice seems to be, to allow of its becoming slightly sour; this sourness takes place in the cheesy matter, or casein, that is mixed in the cream, and has no effect upon the butter beyond causing its more speedy and perfect separation.

In many dairies the practice is to churn the whole milk. This requires larger churns, and is best done by the aid of water or animal power; it is considered to produce more butter, and this is said by some to be finer and of better quality. I do not think that there have been any very decisive experiments upon this point.

The excellence of butter is greatly influenced by the temperature of the milk or cream, at the time of churning; if this be either too hot or too cold, it is difficult to get butter at all, and when got it is usually of poor quality. A large number of experiments have been made with regard to this point, and the result arrived at is, that cream should be churned at a temperature, when the churning commences, of from 50 to 55 degrees of Fahrenheit's thermometer. If whole milk is used, the temperature should be about 65 degrees F. at commencing. In summer, then cream would need cooling, and sometimes in winter a little warmth. It is surprising how the quality of the butter is improved by attention to these points. I have seen churns made double, so that warm water, or some cooling mixture, according as the season was winter or summer, might be put into the outer part. It will be seen, that in whatever way the temperature is regulated, a thermometer is a most important accompaniment to the dairy.

The time occupied in churning, is also a matter of much consequence. Several churns have been exhibited lately, which will make butter in from 3 to 10 minutes, and these are spoken of as important improvements. The most carefully conducted trials on this point, have shown that as the time of churning was shortened, the butter grew poorer in quality; and this is consistent with reason. Such violent agitation as is effected in these churns, separates the butter, it is true, but the globules are not thoroughly deprived of the casein which covers them in the milk; there is consequently much cheesy matter mingled with the butter, which is ordinarily soft, and pale, and does not keep well. Until the advocates of very short time in churning can show that the butter made by their churns, is equal in quality to that produced in the ordinary time, farmers had better beware how they change their method, lest the quality of their butter, and consequently the reputation of their dairy, be injured.

Butter contains two kinds of fat. If melted in water at about 180 F., a nearly colorless oil is obtained, which becomes solid on cooling. If the solid mass be subjected to pressure in a strong press, at about 60 F., a pure liquid oil runs out, and there remains a solid white fat. The liquid fat is called *elaine*, and the solid fat *margarine*. These two bodies are present in many other animal and vegetable oils and fats. They are both nearly tasteless, and when quite pure, will keep without change for a long time. In presence of certain impurities, however, they do change.

If great care is not taken in washing and working, when making butter, some buttermilk is left enclosed in it; the buttermilk, of course, contains casein, the nitrogenous body which we have already described; there is also some of the milk sugar before mentioned. The casein, like all other bodies containing much nitrogen, is very liable to decomposition. This soon ensues therefore, whenever it is contained in butter; and certain chemical transformations are by this means soon commenced, whereby the margarine and elaine are in part changed to other and very disagreeable substances; those which give the rancied taste and smell, to bad butter. The milk sugar is instrumental in bringing about these changes. It is decomposed into an acid by the action of the casein, and has a decided effect upon the fatty substance, of butter, causing them to become rancid. This action and consequent change comes on more or less rapidly, as the temperature is warmer or colder.

No matter how well the butter is made in other respects, if butter-milk be left in it, there is always, from the causes above mentioned, a liability to become rancid and offensive. When packed in firkins, it will be rancid next to their sides and tops; will be injured to a greater or less depth, and as the air may have obtained access. Salting will partially overcome the tendency to spoil, but not entirely unless the butter is made so salt as to be hardly eatable. Another reason for much of the poor butter, which is unfortunately too common, is to be found in the impure quality of the salt used. This should not contain any magnesia or lime, as both injure the butter; they give it a bitter taste, and prevent its keeping for any length of time. Prof. Johnson mentions a simple method of freeing common salt from those impurities. It is to add to 30 lbs. of salt about 2 quarts of boiling water, stirring the whole thoroughly now and then, and allowing it to stand for two hours or more. It may be afterwards hung up in a bag, and allowed to drain. The liquid that runs off is a saturated solution of salt, with all the magnesia and lime which were present. These are much more soluble than the salt, and are consequently dissolved first.

Want of caution as to the quality of salt used, and of care in separating the buttermilk, cause the spoiling of very great stocks of butter every year; a large part of that sent to Europe is sold for soap grease, and for other common purposes, simply because these points have been neglected."

Shelter for Cattle in Autumn.

Messrs. Editors,—Those chilling storms and frosty nights which have begun once more to visit us, have called my attention to an error practised by many farmers in leaving a portion of their stock to lie upon the ground at night, yarded in the open air, and exposed to all the vicissitudes of the weather, at a time too when the heat of the preceding summer has induced such a habit of body as to render them highly sensitive to the first approach of cold. If we would reason from our own exp rience, we should see that it is the transition from one extreme of climate to another which affects them most seriously, and we ought, consequently, to pay a special attention to their comfort at such times.

Cows that have been allowed to remain in pa ture at night, or yarded away from the barn, should now be furnished at night, at least every cold and stormy one, with shelter and a *dry* place to lie.

Young stock should when it is practicable, be similarly provid d for; although many farmers think they may be allowed, like sheep, to find their shelter where they find their food, till they are finally brought into winter quarters.

These suggestions are not urged principally upon the score of humanity, although that is not to be overlooked, but it is to be borne in mind that as the thrift and value of animals are inseparably connected with their bodily comfort, the profits to be derived from them are increased or diminished in direct proportion as that is promoted or impaired.

American Agriculturist.

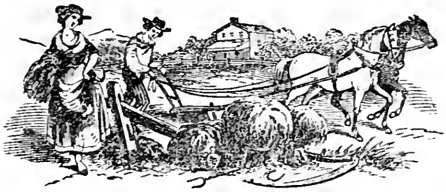
Sealing-wax for Fruit Cans.

Don't buy any sealing-wax for your bottles of fruit or fruit juice called wine; or anything else that you want to seal up for future use. Make it yourself "How?" We will tell you. These are the ingredients. Beeswax, ½ oz; English vermillion, 1½ oz; gum shellac, 2½ oz; rosin, 8 oz. Take some cheap iron vessel that you can always keep for the purpose, and put in the rosin and melt it, and stir in the vermilion. Then add the shellac, slowly and stir that in, and afterwards beeswax. When wanted for use at any after time, set it upon a slow fire and melt so you can dip bottle-nozzles in. Recollect that the vermilion is only put in for the looks of the thing, and if you want to use it for any purpose where color is no object, as for instance sealing over wounds upon trees, you may leave the color out. T e ingredients for the above, bought in this city, cost only 25 cents, for which and a little trouble you can make three-quarters of a pound of good sealing-wax for any common use. For any purpose, such as an application to trees, where you want it tougher than the above preparation will make it, add a little more beeswax, and leave out the vermilion.—*N. Y. Tribune.*

[If the vermilion is left out in the above, it will be all the better for it, as this is a sulphur of mercury and is merely used for coloring purposes.—*Scientific American.*

Grinding Feed.

"If a machine was invented to *grind* hay," says the London *Farmer,* "the ground article would approximate in value to *unground* oats in producing fat and muscle. *Chopping* hay and stalks is the process that comes nearest to the grinding, and relieves the animal of just so much labor as it takes to do it. Twenty-five pounds of dry hay a day is a good deal of work for the muscles of one pair of Jaws, if they have the whole burden of its reduction to small bits and powder; this labor affects the whole system, retarding the animal's growth and rendering more food necessary to supply the waste of its tissue.



The Southern Planter.

RICHMOND, VIRGINIA.

Agricultural Fairs.

Among the most prominent evidences of increased interest and energy, in the promotion of agricultural progress and prosperity, we think the rapid multiplication of Fairs throughout our whole State, may safely be considered: and they are, too, the best mode of keeping alive that special interest in all that pertains to husbandry,—which we are glad to believe has been awakened greatly, through their instrumentality, in the breasts of all our farmers.

But a few years since, and we had only two exhibitions in our borders, and these were County Societies, which owed their origin to a few public-spirited gentlemen, who, by their energetic efforts to induce a more liberal and thorough system of tillage, which should better conform to the scientific teachings of the age, acquired for themselves the reputation of "book farmers." With this name was coupled an intimation that nothing *practical* was to be expected from such men, but rather that they were themselves pursuing and recommending to others to follow in their footsteps, a path which would only lead to loss, by a course of extravagant culture of their lands—based, for the most part, on "sky scraping" theories, rather than economical experiment and actual fact. But time has proved the benefits arising from these associations for developing and improving the agricultural interests of the country—even to the most prejudiced eyes.

We have seen the fruits of these annual gatherings, by the taste for improvement in our lands, implements and stock of every description, which has been created among the mass of our farmers in every part of our State. A general spirit of inquiry has gone abroad from these scenes, which has greatly tended to swell the ranks of the "book farmers," and to furnish to agriculturists a great deal of valuable information of both a scientific and practical character, which was entirely unknown to our forefathers.

Our system of farming has been changed from a mere routine of crops, and imperfect tillage, which were, for the most part, planted and performed at a certain season and in a given manner, with no better reason for their time and sowing, and mode of cultivation, than that "my father did so before me."

While we have yet much to learn, of agriculture as a science, still we have abundant reason to congratulate the whole farming community, on the rapidity with which improved modes of culture, sound philosophy, and a knowledge of the truths of Chemistry and Vegetable Physiology, are advancing among our masses. Our farmers, as a class, do not work less than they formerly did, they think more, and have their thoughts better guided by the discoveries of science. Negligence of the affairs of the farm on the part of the owner, is by no means as common as it was formerly, and sounder views of the respectability and dignity of labour, pervade all classes. The time is not far distant, when only he will be a "poor farmer" who shuts his eyes to the truths presented him, and stops his ears to the counsels of his neighbours.

It is not to the want of a more remunerative system of cropping, which has become a necessity, from the higher price labour commands among us; or the more expensive style of living adopted by all classes, *alone*, to which we must attribute the changes for the better in the cultivation of our lands—but to the more general intelligence and intimate association of our farmers. Another effect of the same cause is the formation of numerous Agricultural Societies, and Farmers' Clubs, and the many "shows," which have enlivened so many places in our State for several years past. While they have afforded to many of our citizens moments of unalloyed pleasure, they have been also productive of profit, by presenting to our inspection, new inventions, and the varied products of industry, taste and skill in the several departments of mechanical, horticultural, and agricultural enterprize. The honourable competition for "premiums," has excited a generous spirit of emulation, and a desire to accomplish ourselves as much as has been performed by our neighbours.

The beauty of improved breeds of animals has delighted our eyes, and made them weary of beholding the "high bones and low flesh" of our "old field" stock, which are the "Ishmaelites" of so many neighbourhoods. But along with all the other benefits derived from these annual gatherings, we have displayed the bone and sinew of the country,—aye, the fat and muscle also, and lastly, but by no means least in the estimation of all our gentlemen, the array of female beauty and loveliness, of the hearts, minds, and persons of "wives, daughters, and sweethearts," who always enliven and grace the grounds.

It is this happy reunion of friends at the "jubilee" in honour of a good cause, which calls out fresh and warm feelings in our hearts, that tend to strengthen the bands of fraternity, hospitality, and affection for those of the same calling. Our circle of acquaintance is enlarged, and all the impulses and feelings which fit man for a social creature are exercised and augmented. Whatever tends to arouse our sympathies and draw us closer in affection for our fellows, is good for us; and the time we spend in such a manner as will ensure this result, is not lost, but rather is garnered up as a part of the sum, which, when fully made up, will secure for us a "perfect day."

So far as we are informed, to the town of Fredericksburg (which has been the birthplace and home of so many "*good fellows*") belongs the credit of establishing the first Agricultural Society and Fair in Virginia. Henrico county and Richmond city combined, and followed her example; and although both of these Societies languished and died out for awhile, yet they were the means of accomplishing a great deal of good by infusing into their members new life as agriculturists. The Fredericksburg Society is again living under the name of the Rappahannock Valley Society, and in the place of the old Henrico at Richmond, we have the Central and State Fairs whose exhibitions have attracted large crowds and reflected credit on our State. Nor are these all of the associations engaged in the good work; but we may add to the list those of Winchester, Lynchburg, Petersburg, Norfolk, Wytheville, Suffolk, Alexandria, and the "Loudoun Colt Club."

The same spirit of progress which has given rise to the organization of these different Societies, has shown a still greater development in the formation of agricultural schools in connection with our State University and Military Institute. It is to the liberality of private citizens, that we are indebted for these great public favours, and we confidently look to them as the means of accomplishing, in the future, an amount of benefit to the agricultural cause, and the young men of our State, which cannot be over-estimated.

The necessity for such schools has been widely felt among us; and we rejoice to know that they will soon be in operation under the guidance and control of liberal and competent men.

The Fairs at Richmond, Petersburg, and Norfolk.

We had the pleasure of attending all three of the Exhibitions first named, and so far as their *success* may be attested by a large crowd of visitors, and a goodly array of agricultural material, it is only acknowledging their just claims, to pronounce them eminently successful.

The amount of stock, machinery, &c., at Norfolk was, of course, smaller than at Richmond and Petersburg, since the Fair represented a much smaller district than did either of the others. But in point of money received at the gates, it had a very desirable pre eminence, and its financial condition, as shown by its treasurer's report, is equal to that of any other society anywhere. taking into consideration the number of members belonging to it. The display of Ladies' Work proved that, in taste, industry and skill, many a member of the Union and Sea-Board Society might, with pride, recognize his wife as his "*better-half;*" and we can truly say, that if the *men* of Virginia would only fill up *their* departments at our Fairs with such samples of their zeal and industry, as did the *ladies* at Norfolk and Petersburg, we might hereafter dispense with all fears of a failure in any of our annual exhibitions. With an eye more for the useful than the ornamental, we were better pleased with the samples of "Virginia cloth," home-made blankets, quilts and counterpanes exhibited by the ladies, than we were with the collars and other embroideries, and specimens of fancy work, which adorned the walls of the same buildings. It may be because we were so much a better judge in one case than the other, that our fancy was led to be partial to counterpanes and quilts, (in Petersburg particularly.) At all events, no man in the Commonwealth would give more demonstrative evidence of his appreciation of their merits, by submitting to a longer nap, in a cold night, under their protection, than ourselves.

The display of horses, cows and swine was most excellent, both in Richmond and Petersburg. We saw some of the finest specimens of *Devons* that we ever had the pleasure of examining, among the herds of Messrs. *Strandburg* and *Brown*, of *Maryland;* and *Pendleton*, of Louisa, and *Davis*, of Loudoun counties of our own State.

Messrs. *Sanders* (of Wythe), *Young* (of Grayson), and *Ficklen* (of Albemarle), exhibited very fine *Short-Horns*. *Crockett & Irvine*, and Captain Buford, *Fat Cattle*, and some beautiful *grades*. Mr. Peyton Johnston, of Richmond, the handsomest *Alderney* Cow, and Jno. B. Crenshaw, of Henrico, the best *Ayrshire Bull* we ever saw.

The display of *Sheep* was not so large as usual, in point of numbers; but the flocks of Messrs. *Rives* and *Bradford* were *well represented.*

Of *Horses* there was a large number on exhibition--*Thoroughbreds, Morgan Black Hawks*, and *Cleveland Bays*. Mr. S. W. Ficklen, of Charlottesville, had a splendid stallion and a brood mare and filley, of Morgan blood, which he had just brought on from Vermont. These, we think, will make a most valuable addition to the "breeding stock" of our State, as they show size, speed, and style.

Dr. Jno. R. Woods, of Albemarle, had a Cleveland Bay colt (just imported from England), which we admired more than any animal of his class we have ever seen; and Mr. H. J. Smith, of Richmond, exhibited "Kossuth," and quite a family of his colts—making an exhibition of which any owner might justly feel proud. One of them (a yearling) was, in our opinion, the perfection of horse flesh. Besides these, many others excited the admiration of everybody who saw them.

An English *cart-horse* (*stallion*), exhibited by Mr. Noland, of Albemarle, was a noble specimen of what the heavy draft horse should be, in appearance, power and muscular development. But we must stop speaking of fine horses, to avoid the crime of envying our neighbor's goods, to which we confess we are very prone in regard to this item, and close our remarks by expressing our unfeigned pleasure at the entire success attending our exhibitions for 1859, held at the following places:

Wytheville,	Richmond,
Winchester,	Petersburg,
Lynchburg,	Suffolk,
Fredericksburg,	Norfolk.

We tender our especial thanks to Messrs. Luther Tucker & Son, of Albany, N. Y., for a copy of their "Illustrated Annual Register of Rural Affairs" for 1860. With 180 engravings. Price 25 cents.

This little work contains more valuable information for farmers, gardeners and house-keepers than any other publication we have ever had the good fortune to meet with, at anything like the same price. *It ought to be in the possession of everybody.*

Fine Wheat.

At the Exhibition of the Sea-Board Agricultural Society, held in Norfolk, we saw a bag of wheat, entered by Mr. Jesse C. Jacobs, of Durant's Neck, Perguimons county, N. C., which contained the most beautiful specimen of white wheat we ever looked at.

Mr. Jacobs, we are sure, would confer a favor on the farmers generally, by giving a history and description of this grain.

Share's Patent Coulter Harrow.

We were much pleased with the work done by this implement, at the Central Fair in Richmond, and the State and Union Fairs in Petersburg. It is endorsed by Messrs. Luther Tucker & Son, of the *Country Gentleman, in Albany*, (whose recommendation of any implement is entitled to great confidence;) and it has also been used by Dr. J. R. Woods, of (Ivy Depot) Albemarle; the Messrs. Boulware and others, of (Guiney's) Caroline county. To all of whom it gave *perfect satisfaction*. We think every farmer ought to have one of these harrows, and are glad to know that they can be procured at all of the agricultural stores in this city, at manufacturer's prices.

"Affleck's Southern Rural Almanac." By *Thos. Affleck*, Washington Co., Texas.

Just received, the list of Trees, &c., grown and sold at the above large Nursery.

We tender thanks to Professor Johnson, for a copy of his valuable work on *Peat, Muck and Commercial Manures*, containing the reports made by him as the Chemist to the Connecticut State Agricultural Society in 1857–'58.

Ro. Buist, Philadelphia, Pa.

Garden Manual and Almanac, with select lists of the most approved varieties of Vegetables, Fruits and Flowers.

Jas. Guest, Richmond.

Catalogue of Fruit and Ornamental Trees. Flowers, &c., for sale at his Nursery.

Wm. R. Prince, Flushing. Long Island.

Catalogue of Foreign and Native Grape Vines, with remarks on their culture.

Franklin Davis, Staunton, Va.

Catalogue of Fruit, Shade and Ornamental Trees, for sale at his Nursery.

We return our thanks to the publishers of the above, which have been received.

Hot Feed in Winter.

I have 28 chickens large and small, several of them Fall chickens. I obtained but a few eggs the fore-part of Winter—not more than one or two a day The feed was corn and oats. In January I tried the experiment of hot feed once a day, in the morning. As soon as the fire was started in the cook-stove, I put a quart or so of small potatoes in an old dripping pan and set them in the oven. After breakfast I took a quart or more of wheat and buck-wheat bran, mixed, put in the swill-pail, and mixed into thin mush with boiling water, then added about 1 quart of live coals from the stove and put in the potatoes hot from the oven, adding all the egg shells on hand, and sometimes a little salt, and sometimes a little sulphur. These mashed together are fed immediately in a trough prepared for the purpose, made about 10 feet long, of 2 boards 6 inches wide, nailed together, and two short pieces nailed on the ends, with a narrow strip nailed lengthwise on the top, and two bearers under. The object of this was to keep the hens out of the trough, and leave room to eat each side of the narrow strip. At noon I fed 6 ears of corn cut up in pieces an inch long; and in the evening oats and wheat screenings about 1 quart. Now for the result. In about a week the number of eggs increased six fold and in about two weeks, and since, they have ranged from 12 to 20 eggs per day. The coldest weather made no difference. When it was cold and stormy I kept them in the hen house all day, and generally until 10 or 12 o'clock. Such singing over the corn at noon I never heard from hens before—a concert of vocal music that would have done any lover of eggs good to hear.—*A. Du Bois in Am. Ag.*

What can be Done with Paper.

A writer in Blackwood's Magazine says it is wonderful to see the thousand useful as well as ornamental purposes to which paper is applicable in the hands of the Japanese. He states that he saw it made into materials so closely resembling Russian and Morocco leather and pig skin, that it was very difficult to detect the difference. With the aid of lacker varnish and skillful painting, paper made excellent trunks, tobacco bags, cigar cases, saddles, telescope cases, the frames of microscopes; and he even saw and used excellent water-proof coats made of simple paper, which did keep out the rain, and were as supple as the best Mackintosh. The Japanese use neither silk nor cotton handkerchiefs, towels nor dusters; paper in their hands serves as an excellent substitute. It is soft, thin, tough, of a pale yellow color, very plentiful, and very cheap. The inner walls of many a Japanese apartment are formed of paper, being nothing more than painted screens; their windows are covered with a fine translucent description of the same material; it enters largely into the manufacture of nearly everything in a Japanese household; and he saw what seemed to be balls of twine, but which were nothing but long shreds of tough paper rolled up. If a shopkeeper had a parcel to tie up, he would take a strip of paper, roll it quickly between his hands, and use it for the purpose: and it was quite as strong as the ordinary string used at home. In short, without paper, all Japan would come to a dead lock; and, indeed lest by the arbitary exercise of his authority, a tyrannical husband should stop his wife's paper, the sage Japanese mothers-in-law invariably stipulate in the marriage settlement that the bride is to have allowed to her a certain quantity of paper.

Domestic Receipts.

Lemon Pie.—Mix flour and molasses, so that it will just run freely. For each pie, add one drop lemon oil, and you have an excellent pie. Be sure and use the *oil*. Cinnamon is also good.

Scarlet on Woolen.—For two pounds of goods, take two ounces muriate of tin, two ounces cochineal, two ounces cream of tartar. Boil the dye fifteen minutes; then dip in the goods, and air until the color suits. Color in brass or copper.

Make Farm Labour Fashionable.

At the base of the prosperity of any people lies this great principle—*make farm labour fashionable at home.* Educate, instruct, encourage; and offer all the incentives you can offer, to give interest and dignity to labour *at home.* Enlist the heart and intellect of the *family* in the support of a domestic system that will make labour attractive at the homestead. By means of the powerful influences of early home education, endeavour to invest practical labour with an interest that will cheer the heart of each member of the family, and thereby you will give to your household the grace, peace, refinement, and attraction which God designed a *home* should possess.

The truth is, we must *talk* more, *think* more, *work* more, and *act* more, in reference to questions relating to *home.*

The training and improvement of the physical, intellectual, social and moral powers and sentiments of the youth of our country, require something more than the school-house, academy, college and university. The young mind should receive judicious training in the field, in the garden, in the barn, in the workshop, in the parlor, in the kitchen—in a word, around the hearthstone at *home.*

Whatever intellectual attainments your son may have acquired, he is unfit to go forth into society, if he has not had thrown around him the genial and purifying influences of parents, sisters, brothers, and the *man-saving* influences of the family government. The nation must look for virtue, wisdom, and strength, to the education that controls and shapes the home policy of the family circle. There can be no love of country where there is no love of home. Patriotism, true and genuine, the only kind worthy of the name, derives its mighty strength from fountains that gush out around the hearthstone: and those who forget to cherish the household interests, will soon learn to look with indifference upon the interests of their common country.

We must cultivate the roots—not the tops. We must make the *family government,* the school, the farm, the church, the shop, the agricultural fairs, the laboratories of our future greatness. We must educate our sons to be farmers, artizans, architects, engineers, geologists, botanists, chemists—in a word, practical men. Their eyes must be turned from Washington to their States, counties, townships, districts, *homes.* This is true patriotism; and the only patriotism that will perpetually preserve the nation.—*Gov. Wright.*

A little girl asked her sister, "what was chaos, that papa read about?" The other child replied: "Why, it is a great pile of nothing, and no place to put it in!"

Be honest, industrious, and economical, and love your neighbour as yourself.

Cheddar and Parmesan Cheese.

Cheddar cheese is a variety in high repute for its richness, and commands a high price in market. It is made of new milk only, and contains more fat than the egg. It is, indeed, too rich for ordinary consumption. The milk is set with rennet while yet warm, and allowed to stand still about two hours. The whey first taken off is heated and poured back upon the curd, and, after turning off the remainder, that is also heated and poured back in the same manner, where it stands about half an hour. The curd is then put up into the press, and treated very much as the Cheshire up to the time of ripeness.

The Parmesan is an Italian cheese, made of one meal of milk, allowed to stand sixteen hours, to which is added another which has stood eight hours. The cream being taken from both, the skim-milk is heated an hour over a slow fire, and constantly stirred till it reaches about eighty-two degrees, when the rennet is put in, and an hour allowed to form the curd. The curd is thoroughly broken *or cut,* after which a part of the whey is removed, and the curd is then heated nearly up to the boiling point, when a little saffron is added to colour it. It then stands over the fire about half an hour, when it is taken off, and nearly all the rest of the whey removed, cold water being added, till the curd is cool enough to handle. It is then surrounded with a cloth, and, after being partially dried, is put into a hoop, and remains there two days. It is then sprinkled with salt for thirty days in summer, or forty days in winter. One cheese is then laid above another to allow them to take the salt; after which they are scraped and cleaned every day, and rubbed with linseed oil to preserve them from the attacks of insects, and they are ready for sale at the age of six months.—*Flint's Dairy Farming.*

Paddy Describes America.

"Where did baccy come from, Corney?" inquired Mary.

"Why, from Meriky, where else?" he replied—"that sent us the first pitaty. Long life to it for both, say I."

"What sort of a place is that, I wonder?"

"Meriky, is it?—they tell me its mighty sizeable, Moll, darling; I'm told that you might roll England through it, and it would hardly make a dint in the ground. There's fresh water oceans inside of it that you might drown Ireland in, and save Father Matthew a wonderful sight of trouble: and as for Scotland, you might stick it in a corner of one of their forests, and never find it but for the smell of whiskey. If I had only a trifle of money, I'd go and seek my fortin' there."

Educate your children, if you wish them to be useful and happy in life.

Beautiful Extract.

The following beautiful tribute to Woman was written several years ago. It occurs in a tale of touching interest, entitled "The Broken Heart:"

"Oh, the priceless value of the love of a *pure* woman! Gold cannot purchase a gem so precious! Titles and honors confer upon the heart no such serene happiness. In our darkest moments, when disappointment and ingratitude, with corroding care gather thick around, and even the gaunt form of poverty menaces with his skeleton fingers, it gleams around the soul with an angel's smile. Time cannot mar its brilliancy; distance but strengthens its influence; bolts and bars cannot limit its progress; it follows the prisoner into his dark cell, and sweetens the homely morsel that appeases his hunger, and in the silence of midnight it plays around his heart, and in his dreams he folds to his bosom the form of her who loves on still, though the world has turned coldly from him. The couch made by the hand of the loved one is soft to the weary limbs of the sick sufferer, and the potion administered by the same hand loses half its bitterness. The pillow carefully adjusted by her brings repose to the fevered brain, and her words of kind encouragement revive the sinking spirit. It would almost seem that God, compassionating woman's first great frailty, had planted this jewel in her breast, whose heaven-like influence should cast into forgetfulness man's remembrance of the Fall, by building up in his heart another Eden, where perennial flowers forever bloom, and crystal waters gush from exhaustless fountains."

Remedy for the Bite of Mad Dogs. A Saxon forester, named Gastell, now of the venerable age of 82, unwilling to take to the grave with him a secret of so much importance, has made public in the *Leipsic Journal* the means which he has used for fifty years, and wherewith he affirms he has rescued many human beings and cattle from the fearful death of hydrophobia.—Take immediately warm vinegar or tepid water wash the wound clean there-with, and then dry it; then pour upon the wound a few drops of hydrochloric acid, because mineral acids destroy the poison of the saliva, by which means the latter is neutralized.

Death has nothing terrible in it, but what life has made it.

Number of Seeds in a Bushel.

A Scotch paper gives the following table, said to be based upon actual trials of the number of various kinds of seeds in a bushel. It also adds the weight by which we can judge how the bushel measures compare with ours:

Name.	No of seeds pr lb.	No. of lbs. pr bushel.
Wheat,	10 500	58 to 64
Barley,	15 400	48 to 66
Oats,	20 000	38 to 42
Rye,	23 000	56 to 60
Canary Grass,	54 000	
Buckwheat,	25 000	48 to 50
Turnips, (Rendle's Swede.)	155 000	50 to 56
Turnip, (Cornish Holdfast,)	239 000	50 to 56
Turnip, (Orange Jelly,)	233 000	50 to 56
Cabbage, (Scotch Drumhead,)	128 000	56
Cabbage, (Drumhead Savoy,)	117 000	50 to 56
Clover, (Red,)	249 600	60
Clover, (White,)	686 400	50 to 56
Rye Grass, (Perennial,)	314 000	20 to 28
Rye Grass, (Italian,)	272 000	13 to 18
Sweet Vernal Grass,	923 200	8

Worth Remembering.

The following were Jefferson's ten rules to be observed in practical life:

1st. Never put off till to-morrow, what you can do to-day.

2nd. Never trouble others for what you can do yourself.

3rd. Never spend your money before you have it.

4th. Never buy what you do not want, because it is cheap.

5th. Pride costs us more than hunger, thirst and cold.

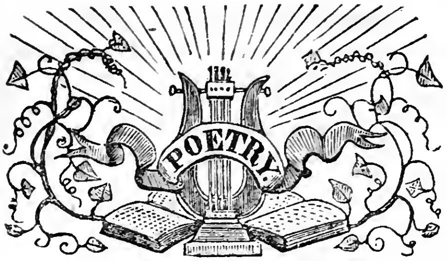
6th. We never repent of having eaten too little.

7th. Nothing is troublesome that we do willingly.

8th. How much pains have those evils cost us, which have never happened.

9th. Take things always by their smooth handle.

10th. When angry count ten before you speak, if very angry, a hundred.



To My Mother.

WRITTEN BY MISS DAVIDSON, IN HER SIXTEENTH YEAR.

O, thou whose care sustained my infant years,
And taught my prattling lip each note of love:
Whose soothing voice breathed comfort to my fears,
And round my brow Hope's brightest garland wove:

To thee my lay is due, the simple song,
Which Nature gave me, at life's opening day;
To thee these rude, these untaught strains belong,
Whose heart indulgent will not spurn my lay.

O say, amid this wilderness of life,
What bosom would have throbbed like thine for me?
Who would have smiled responsive?—who, in grief,
Would e'er have felt, and, feeling, grieved like thee?

Who would have guarded, with a falcon-eye,
Each trembling foot-step, or each sport of fear?
Who would have marked my bosom bounding high,
And clasped me to her heart, with love's bright tear?

Who would have hung around my sleepless couch,
And fanned, with anxious hand, my burning brow?
Who would have fondly pressed my fevered lip,
In all the agony of love and woe?

None but a mother—none but one like thee,
Whose bloom has faded in the midnight watch,
Whose eye, for me, hast lost its witchery,
Whose form has felt disease's mildew touch.

Yes, thou hast lighted me to health and life,
By the bright lustre of thy youthful bloom—
Yes, thou hast wept so oft o'er every grief,
That woe hath traced thy brow with marks of gloom.

O then, to thee, this rude and simple song,
Which breathes of thankfulness and love for thee:
To thee, my mother, shall this lay belong,
Whose life is spent in toil and care for me.

Be Kind to Each Other.

Oh, be kind to each other!
For little ye know
How soon ye may weep
The sad tears of woe,
For a brother, or sister, or friend loved and dear,
Reposing in stillness on death's sable bier.

Be kind to each other!
For little ye know
How soon ye may weep
O'er a desolate home,
Or yearn for the forms that have passed away
To dwell in the light of a happier day.

Be kind to each other!
And strive, day by day,
To render some kindness
To soften life's way;
And remember that friends the last ones should be
To sneer at the faults in each other they see.

Be kind to each other!
For short is life's span:
We must crowd in its compass
All the good acts we can.
Each hour should recall, as it passes away,
Some being made glad by love's kindly sway.

The Heart.

The heart—the heart! oh, let it be
A true and beauteous thing—
As kindly warm, as nobly free,
As eagle's nestling wing.
Oh! keep it not like miser's gold,
Shut up from all beside;
But let its precious stores unfold
In mercy far and wide.
The heart—the heart that's truly blest,
Is never all its own;
No ray of glory lights the breast
That beats for self alone.

The heart—the heart! oh, let it spare
A sigh for others' pain;
The breath that soothes a brother's care,
Is never spent in vain.
And though it throbs at gentlest touch,
Or sorrow's faintest call,
'Twere better it should ache too much
Than never ache at all.
The heart—the heart that's truly blest,
Is never all its own;
No ray of glory lights the breast
That beats for self alone.

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